

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

FEBRUARY 1992
VOLUME FIVE NUMBER SEVEN
SEVEN DOLLARS

COVER STORY:

Small-Biz CIOs And Their Big Ideas

With EDI, Being Nice Is No Dice

AN INTERNATIONAL DATA GROUP PUBLICATION

**Daddy's Junky Music
Stores' David Wright**

DIGITAL OPENS W CHEMICAL REACTION POS



If open computing is the formula for success in the chemical industry, Digital's Network Application Support (NAS) Environment for Manufacturing is the catalyst.

An innovative approach to open computing, NAS makes it possible for each and every department in your company to work together and share information as never before.

To react more quickly to changing production conditions and new business opportunities.

To boost manufacturing effectiveness and customer satisfaction.

The NAS Environment achieves all this by linking different computers from different vendors not merely through network connections, but through application integration as well. Which gives people all over the plant the means to access data from wherever it might reside, then work with that data in their own applications.

Such power is what makes NAS different from other "open" solutions. What makes it possible are proven products and services based on industry standards. With them, you have the

NAS FROM DIGITAL.

© DIGITAL EQUIPMENT CORPORATION 1991. FOR MORE INFORMATION ON BECOMING AN APPLICATION PROVIDER FOR DIGITAL, CALL 1-800-343-4040, EXT. PARTNER. THE DIGITAL LOGO AND VAX ARE TRADEMARKS OF DIGITAL EQUIPMENT CORPORATION.

WORLD'S LARGEST COMPANY

ACTIVE TO NAS!

ability to integrate Digital computers, IBM and HP machines, PC compatibles, MACs, and systems from leading control vendors.

You have the freedom to install the solutions that are right for your needs. Now and in the years to come.

You have a choice of over 1,500 leading software applications already written for NAS. More than you'll find on any other vendor's integration platform, and the list is growing every day.

At Digital, we're using NAS to open our own multivendor manufacturing environment. Recently it

helped us design and bring to market our VAX 4000 Series in record time, with reduced cost and fewer change orders than ever before.

NAS can be the catalyst for your success, too. Whether you're in chemicals, pulp and paper, aerospace, automotive, industries of all types. We're opening our lines to help you find out more. Call 1-800-343-4040, ext. 556. Or write Digital Equipment Corporation, 600 Nickerson Rd., Dept. MET1-DD7, Marlboro, Massachusetts 01752.

digitalTM



THE OPEN ADVANTAGE.

IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES CORPORATION. HP IS A TRADEMARK OF HEWLETT-PACKARD COMPANY.
MAC IS A REGISTERED TRADEMARK OF APPLE COMPUTER INC.

Enough Said.

CA-IDMS® VS. DB2

	CA-IDMS	DB2
Industry Standards:		
Ansi SQL Support	✓	✓
FIPS	✓	✓
SAA	✓	✓
Ansi Standard Domain Integrity, Check Constraint	✓	
Portability: Platforms Supported...		
MVS: MVS/XA	✓	✓
MVS/ESA Dataspace	✓	✓
VSE	✓	
VSE/ESA	✓	
VM	✓	
PC-DOS	✓	
PC LAN	✓	
Fujitsu	✓	
Investment Protection: Runs Applications Without Change From...		
DL/I	✓	
IMS	✓	
VSAM	✓	✓
TOTAL	✓	
Thousands Of Mission-Critical Production Applications	✓	
Continuous Processing Through Dynamic Configuration Support	✓	
Industrial-Strength Application Development	✓	
SQL Access To Existing DB's	✓	
Integrated Relational SQL And Navigational Support In A Single DBMS	✓	
Client/Server Architecture	✓	✓
Century Dates	✓	✓
Integrated Dictionary	✓	
Transient Read	✓	
Referential Integrity	✓	✓
Row Level Locking	✓	
Roll-Back For Complete Backward Recovery	✓	
Case Tool Support	✓	
Bulk Access	✓	
Commit Continue	✓	
Pseudo-Conversational SQL	✓	
SQL Tuning Options: System-Maintained Clustering	✓	
Variable Page Sizes	✓	

When you line up all the facts, it's easy to see why CA-IDMS® is the leading, industrial-strength DBMS thousands and thousands of clients rely on.

Unlike DB2, CA-IDMS can handle all of your mission-critical applications.

It's supported by the most comprehensive architecture ever developed, CA90s: Computing Architecture for the 90s.



And it has all of the advanced features and functionality you need today.

So call 1-800-645-3003 to arrange for an on-site briefing or for more information.

Call now and get the facts.

As you can see, they speak for themselves.

COMPUTER ASSOCIATES
Software superior by design.

CIO

VOLUME 5, NUMBER 7

COVER STORY

Working to Scale

There's nothing small about the problems faced by small-company CIOs, who must be flexible, creative and fearless—or risk losing the business.

By Kathleen Melymuka

36



*A big job for small business 36
Cover photo by George Simian*

FEATURES

Looking for Networking's Mr. Big

Rumor has it that the connectivity jungle may have produced a new king of the beasts—the Chief Networking Officer. Does the genuine article exist, or is it just a phantom of the executive suite?

By Thomas Kiely

28

The High Price of Nice

When its ambitious and highly user-friendly EDI recruitment program faltered, Sears learned that recalcitrant trading partners respond more readily to a hard line than the soft sell.

By Richard Pastore

56

Cyberspace Cadets

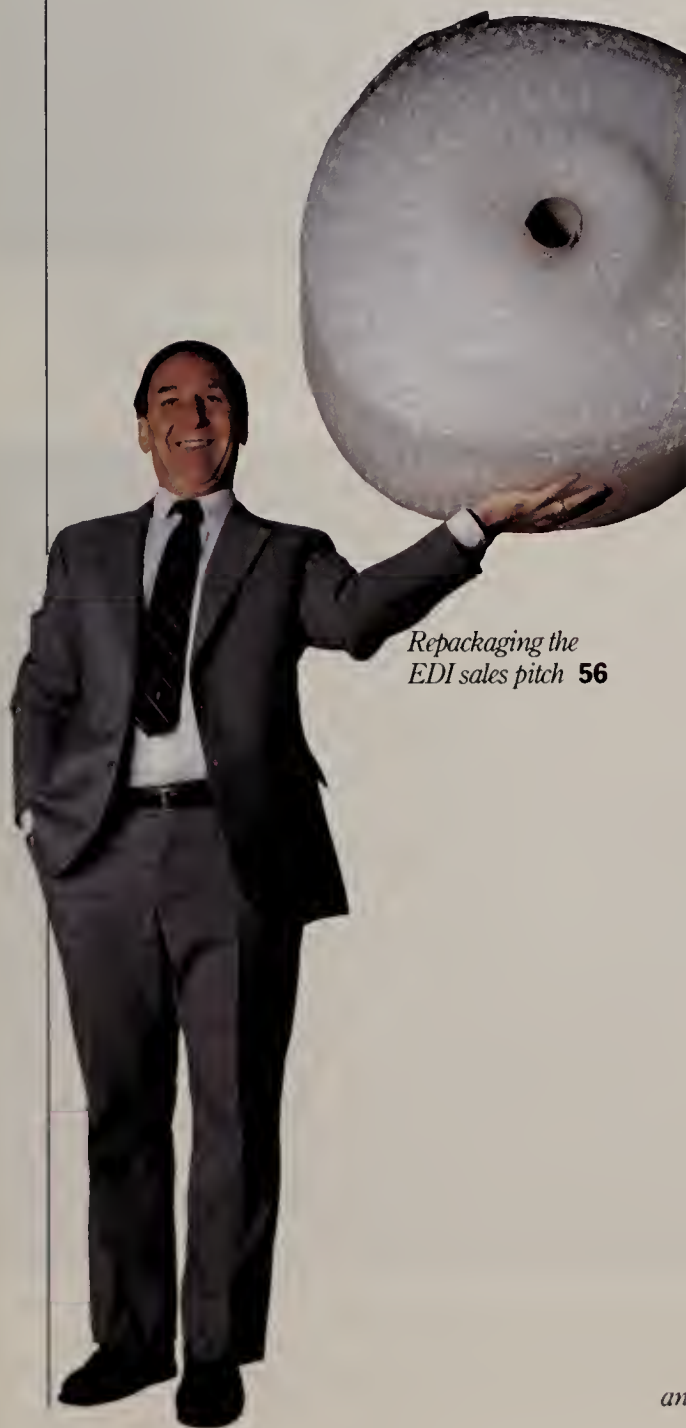
Scratch a hacker, and what do you find? A rebel with a budding criminal record? Or the brains behind your next competitive advantage?

By Thomas Kiely

66

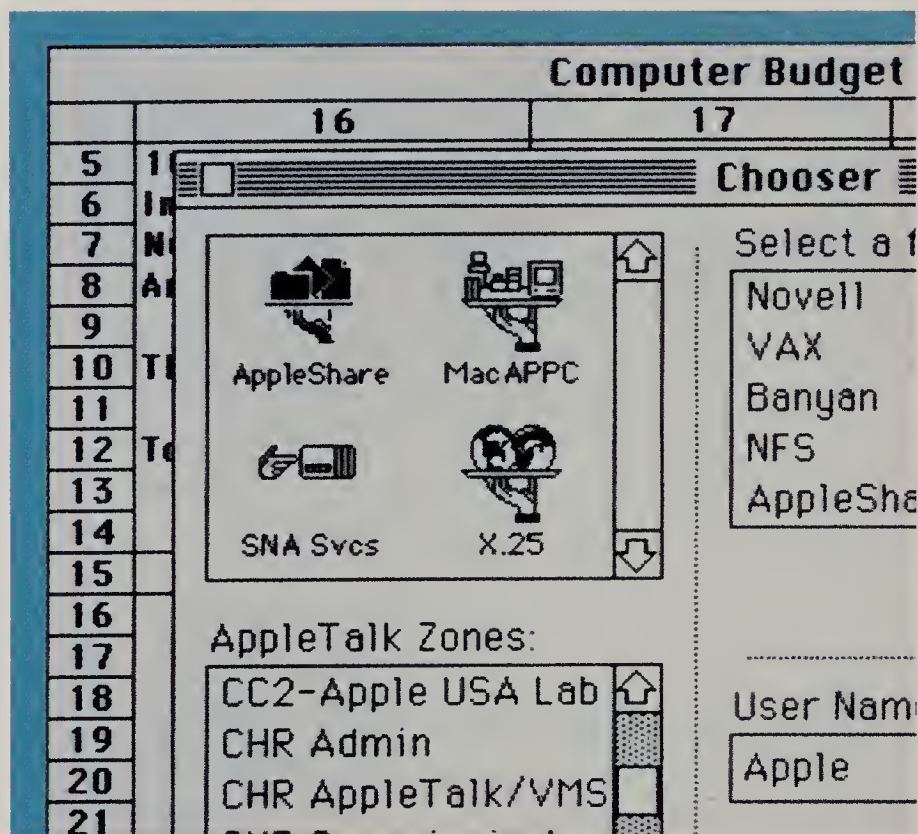
M O R E ▶ ▶ ▶

*For outlaws,
an inside job? 66*



*Repackaging the
EDI sales pitch 56*

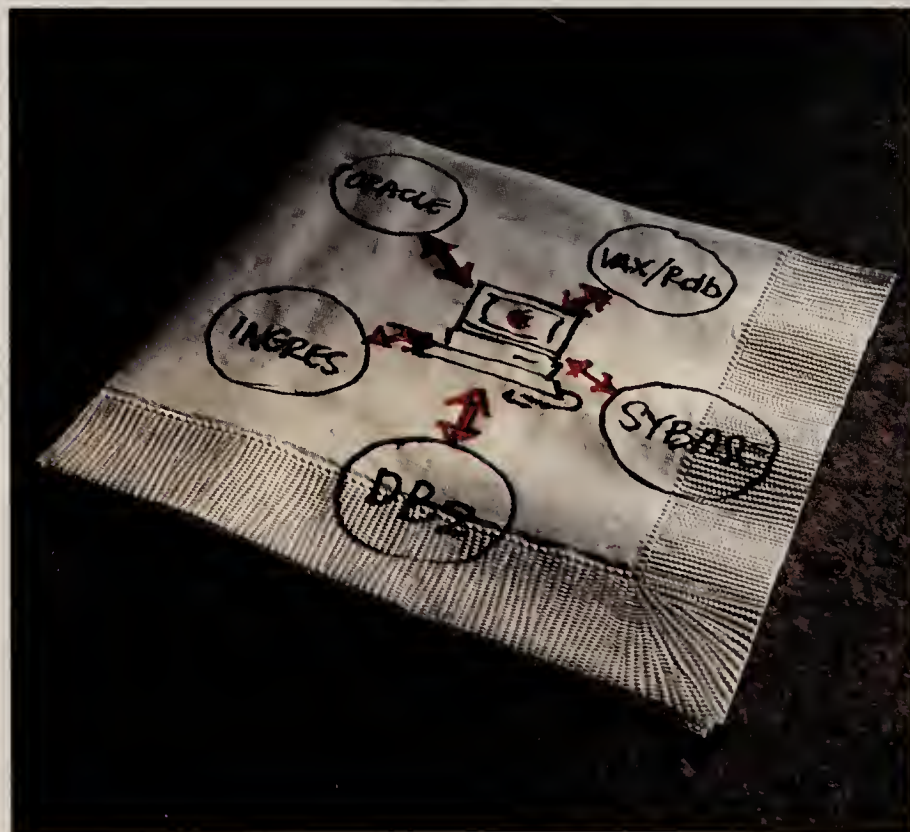
We're open



This is the Macintosh Chooser. A single point of access to a wide range of systems. The Chooser shows available network resources graphically and consistently. Just point the mouse and you're connected.



Macintosh offers an incredible range of tools for connecting with virtually any host-based environment, whether it's running SNA, TCP/IP, DECnet, or OSI.



Apple's Data Access Language (DAL) adapts popular off-the-shelf database, spreadsheet, and data analysis software to major SQL environments. So nontechnical users can easily access remote databases.



Apple A/UX™ lets Macintosh run UNIX® applications plus thousands of Mac® programs. At the same time you can run X-Window and MS-DOS applications, and cut, copy, and paste between any of them. No other desktop computer can do this.

to anything.



Macintosh shares data with DOS PCs via Novell, 3Com, Banyan, and more. Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.



Information isn't much good to people who can't get to it. Macintosh sorts out the complexities of multiple computer systems and presents vast information to people at the desktop in a single, consistent way.

While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases, and multiple networks. Nevertheless, IS people are expected to make these all work together in perfect harmony.

But lately, a lot of people are finding the source of their solution a pleasant surprise: the Apple® Macintosh® computer.

They're finding that Macintosh comes out of the box with sophisticated networking capabilities designed right in.

That Macintosh is open to virtually any host, any file server, or any database, through any network.

That Macintosh makes the desktop the place where diverse systems come together.

And that with Macintosh you can build systems that let even nontechnical users access information from the desktop, no matter where that information resides.

And because Macintosh works with all your networks, databases, and hosts in one consistent and graphic way, it delivers major savings in implementation and training.

In short, Macintosh gives you the power to make information systems more valuable to the people who use them. The power to be your best®.



Macintosh gives people a single, simple view of the information and services that can help them do their jobs and serve your organization. See for yourself. Call 800-635-9550, ext. 501, and we'll send you a free video showing how Macintosh helps unify complex systems.



© 1991 Apple Computer, Inc. Apple, the Apple logo, A/UX, Mac, Macintosh, and The power to be your best are registered trademarks of Apple Computer, Inc. UNIX is a registered trademark of AT&T, and MS-DOS is a registered trademark of Microsoft Corporation. DECnet is a trademark of Digital Equipment Corporation, and X-Window System is a trademark of Massachusetts Institute of Technology. One videotape per customer. Offer good only in the U.S. and while supplies last. Allow 4-6 weeks for delivery.

They're the backbone of American transportation, and they'll change the way you lease computers. Managing a network of tens of thousands of railcars, aircraft and containers is a tremendously complex task. Finding new, more efficient ways to handle the job has made GE the nation's leading transportation lessor. • That same approach has made GE Capital Computer Leasing (formerly Decimus) a leading lessor to Fortune 500 companies. • We offer flexible leasing



arrangements that help you meet corporate, strategic, financial and tax objectives. • In a recent independent survey, our customers rated our performance highest. • We're vendor independent, leasing both new and used equipment to give you access to more hardware choices. • And we are GE, your assurance of our financial strength, stability and commitment to your satisfaction.

- Call 1-800-4LEASE4 to learn more about the benefits of leasing from GE Capital Computer Leasing. Your perfect partner in these changing times.



GE Capital
Computer Leasing



A safety net
for software 25

COLUMNS

OUTLOOK: ORDERING OUT FOR IS

Despite a hesitancy to cede control of IS resources, CIOs are intrigued by the potential benefits of outsourcing.

By Julie Schwartz

18

INSIGHTS: SUPPORT GROUPS

A third-party software escrow arrangement ensures vendor support for critical applications.

By Adele Kalas

25

HUMAN FACTORS: TEAM TACTICS

Empowered, self-managing teams are proving the most potent weapon in the competition for internal customers at Corning's IS organization.

By Harvey Shrednick, Richard Shutt and Madeline Weiss

74

STATE OF THE ART: HELPING USERS PROGRAM

Most end-user programming tools fall short of users' imaginations and exceed their capabilities. But IS can offload some routine tasks, and quench the growing thirst for user involvement, by getting the right tools to the right users.

By Lucie Juneau

80

WORKING SMART: SuperSONIC

Several years ago, MetLife set out to bolster the productivity of its sales force with a distributed network called SONIC. The network has become so ingrained in sales operations that the staff rarely makes a move without it. Now underwriters are logging on too.

By Megan Santosus

88



Teaming up
for quality 74

DEPARTMENTS

Editor's Letter 10

Publisher's Letter 12

Trendlines 14

- Product innovation
- Video series
- Voice mail for the deaf
- Workplace conflict
- New publications
- Joke contest

FYI 78

Events/Index 86



Workplace
warriors 14

You have several platforms to consider.
You want your production applications to run
over them all. Not a few now, and a few later.
All of them. Now.

**Ingres can show you how to
develop applications on any one platform
and immediately deploy them
on all others.**

—This is not a claim. It's a fact.
By the way, no other
database company can do this for you.
That, too, is a fact.
Interested?
(800) 4-INGRES

See this card? Send it.

**We'll send you an Ingres Solutions Kit
with information on Ingres database, tools
and integration products.**

Name _____ Title _____

Company _____

Address _____

City/State/Zip _____

☐ Please have an Ingres Representative call me.

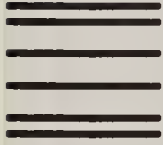
Phone _____



(800) 4-INGRES

©1992, Ingres Corporation. An ASK Company.

GA-878



NO POSTAGE
NECESSARY
IF MAILED
IN THE UNITED
STATES



BUSINESS REPLY MAIL

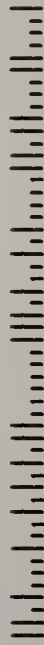
FIRST CLASS PERMIT NO. 133 ALAMEDA, CA

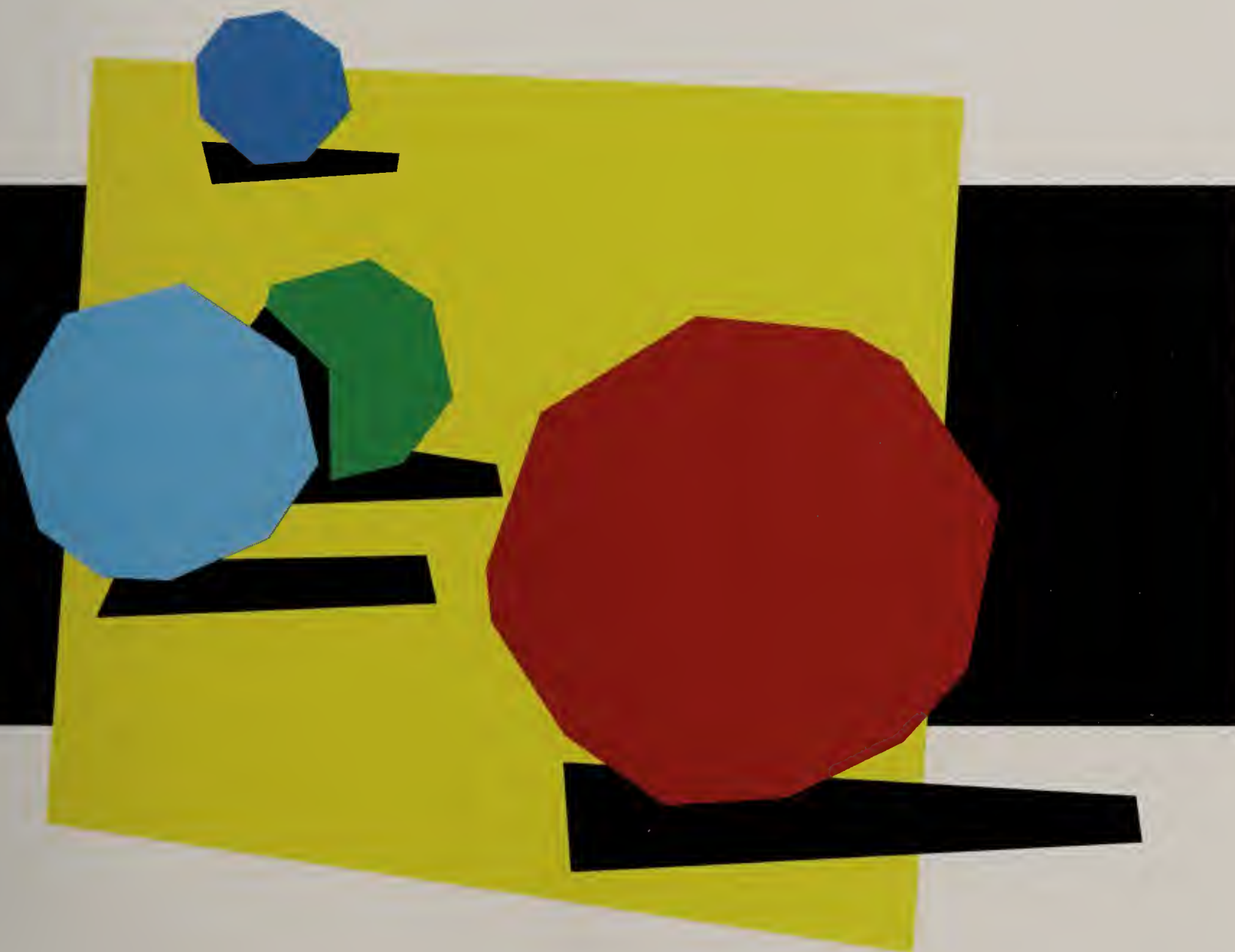
POSTAGE WILL BE PAID BY ADDRESSEE

INGRES

PO Box 4026

Alameda, CA 94501-9930





 Ingres



Among the bright spots on Wall Street these days are small-company mutual funds: They are doing so well that one popular fund recently announced it could handle no additional investors.

Small, less-bureaucratic organizations are often more nimble than larger companies, a crucial advantage now that speed-to-market and flexibility have become corporate watchwords. At our CIO conference last September, management guru and author Tom Peters said that he was fascinated by companies that were becoming more competitive by subdividing into units that function, in effect, as small businesses.

Exploring the phenomenon of small companies from the information executive's perspective seemed to dovetail nicely with the action in the marketplace. In "Working to Scale" (Page 36), Contributing Writer Kathleen Melymuka finds some significant differences between companies with revenues under \$100 million and their larger counterparts.

For example, while large-company CIOs must worry about getting top executives to support IT, at some small companies the top executive also functions as the CIO. Take Mark Klein, president and CEO of Channel Computing, one of whose primary job functions is doing system design. Eventually Klein sees himself passing on the CIO role; but for now IT is so critical that he is shepherding the process himself.

And in a small business, the benefits and drawbacks of new technology are quickly obvious. While these companies may not be the proving grounds for new, sexy technologies, their CIOs are savvy in knowing when IT can provide a power assist, and they can swiftly devise new applications to meet business needs.

Sears Roebuck & Co. would likely envy the nimbleness with which small businesses implement IT. In "The High Price of Nice" (Page 56), Senior Writer Richard Pastore reports on the frustrations surrounding the mega-retailer's goal of getting all of its suppliers into an EDI pipeline. One obstacle has been the failure by suppliers' IS people to recognize the business benefits of electronic interaction; another has been the slow pace at which suppliers are integrating EDI transaction data into existing systems.

Both failings are symptomatic of shortsightedness—also known as mulling "the vision thing." Whether your company is large or small, here's hoping your vision stays sharp.

Marcia Blumenthal



© By CIO Publishing Inc.

Publisher/Editorial Director JOSEPH L. LEVY

Editor-in-Chief MARCIA BLUMENTHAL

Managing Editor LEW MCCREARY

Art and Design Director MARY LESTER MARSHALL

Special Projects Editor ALLAN E. ALTER

Associate Editor ABBIE LUNDBERG

Associate Editor LEIGH BUCHANAN

Senior Writer THOMAS KIELY

Senior Writer MEGHAN O'LEARY

Senior Writer RICHARD PASTORE

Editorial Researcher MEGAN SANTOSUS

Assistant Art Director MOIRA GILLIS

Design Associate KIM MORNEAU

Editorial Assistant MINA C. AHN

Director of Marketing CATHY O'LEARY HAYES

VP of Operations LESLIE L. FALKNER

Production Director LORI BETH SADEWITZ

Director of Finance & Admin. NANCY A. BRYSON

Assistant to the Publisher DIANE MARTIN

Circulation Director CAROL SPACH

Fulfillment Manager SUSAN WOODWORTH

Sales & Marketing Specialist BRIDGET CAMMARATA

Operations Assistant BEVERLY BIGHAM

VP/GM, Executive Programs LYNDA ROSENTHAL

Executive Program Manager WALTER MANNINEN

Marketing Services Manager LORI CARDARELLI

Contributing Writers Lucie Juneau, Adele Kalas, Kathleen Melymuka, Julie Schwartz, Harvey Shrednick, Richard Shutt, Madeline Weiss

CIO Editorial Advisory Board Ronald T. Brzezinski (Coopers & Lybrand), William L. Harrison (The Hartford), James S. Marston (American President Companies Ltd.), Pat Mullen (Digital Equipment Corp.), John F. Rockart (Center for Information Systems Research), Robert W. Stearns (Motorola Codex), Patricia M. Wallington (Xerox Corp.)

Editorial Offices CIO Publishing Inc., 492 Old Connecticut Path, P.O. Box 9208, Framingham, Mass. 01701-9208 (508) 872-8200. **Subscriber Services** (800) 788-4605.

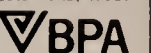
International Data Group

Board Chairman PATRICK J. MCGOVERN

President WALTER BOYD

Executive Vice President WILLIAM P. MURPHY

CIO is a publication of International Data Group, the world's largest publisher of computer-related information. International Data Group publishes over 130 computer publications in more than 40 countries. Nineteen million people read one or more International Data Group publications each month. International Data Group's publications include: **Argentina's** Computerworld Argentina; **Asia's** Asian Computerworld; **Australia's** Computerworld Australia; **PC World**, Macworld; **Austria's** Computerwelt Oesterreich; **Brazil's** DataNews, PC Mundo; **Canada's** ComputerData; **Chile's** Informatica, Computacion Personal; **Colombia's** Computerworld Colombia; **Denmark's** CAD/CAM World, Computerworld Danmark; **PC World**, Macworld, Unix World; **Finland's** Mikro PC, Tietoviikko; **France's** Le Monde Informatique, Distributique, InfoPC, Telecoms International; **Hungary's** Computerworld SZT, Mikrovilag; **India's** Computers & Communications; **Israel's** People & Computers; **Italy's** Computerworld Italia; **PC World** Italia; **Japan's** Computerworld Japan, Infoworld, Publish; **Korea's** Hi-Tech Information/Computerworld; **Mexico's** Computerworld Mexico, PC Journal; **The Netherlands's** Computerworld Netherlands; **PC World**, Amiga World; **New Zealand's** Computerworld New Zealand; **PC World** New Zealand; **Nigeria's** PC World Africa; **Norway's** Computerworld Norge; **PC World** Norge CAD/CAM, Macworld Norge; **People's Republic of China's** China Computerworld, China Computerworld Monthly; **Poland's** Computers; **Spain's** CIM World, Comunicaciones World, Computerworld Espana; **PC World**, Amiga World; **Sweden's** ComputerSweden, PC/Nyheterna, Mikrodatorn, PC World, Macworld; **Switzerland's** Computerworld Schweiz; **Taiwan's** Computerworld Taiwan; **PC World**, **United Kingdom's** Graduate Computerworld, PC Business World, ICL Today, Lotus UK, Macworld U.K.; **United States's** Amiga World, CIO, Computerworld, Digital News, Federal Computer Week, GamePro, inCider, Infoworld, International Custom Publishing, Macworld, Network World, PC Games, PC World, Portable Computing, PC Resource, Publish!, Run, Sun Tech Journal; **USSR's** PC World USSR, Manager, PC Express, Network; **Venezuela's** Computerworld Venezuela, Micro Computerworld; **West Germany's** Computerwoche, Information Management, PC Woche, PC Welt, Amiga Welt, Macwelt.



The Truth About Outsourcing.

When you first look at outsourcing, you may think it's cheaper to manage your own data

network. But be careful. Beneath the base costs of leased lines, there are many hidden costs associated with doing it yourself. Costs like employee expense, equipment maintenance fees, depreciation and rental charges, network management software and datacom staff training. Just to name a few. When you add it up, doing it yourself isn't such an inexpensive idea.

Outsourcing with

Cylix eliminates the un-

knowns of managing your own data

network. Not to mention the cost of wasted time

when something goes wrong and the phone company

and equipment vendors give you the runaround.

With Cylix, you don't have those problems,

because we manage your data

network for you. We

order, install, manage

and maintain all

modems, DSUs/CSUs,

and leased lines. We provide a minimum 99.5% network availability

and an average Mean Time To Repair of under four hours. All for one

monthly fee that will save you at least 10% on the operating costs of

trying to do it yourself. Figure out for yourself how much you

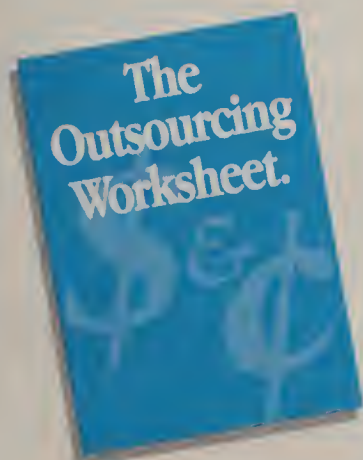
can save by outsourcing with Cylix. Get *The Out-*

sourcing Worksheet and

Questions and Answers

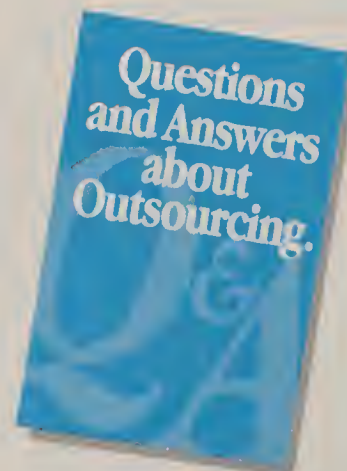
about Outsourcing by

calling 1-800-234-2954.



Cylix COMMUNICATIONS CORPORATION

The Data Network Experts.





"Large companies have to overcome inertia—both economic and methodological. They have to be driven [to change] by a very specific motivation. Smaller companies will make a change because they tend to be at the leading edge."

Chuck Thomas
President and CIO
Apris Corporation

In this issue, *CIO* reports on the role of chief information officers in smaller companies, those with annual revenues of less than \$100 million. Our research reveals that, unlike their counterparts in larger organizations, small-business CIOs tend to wear several hats.

For example, it's not uncommon for these people to function as the president or chief operating officer as well as the CIO. This gives them immediate clout at the top, a broader view of the business as a whole and insight into how information technology can be utilized to achieve corporate goals. And because they are also much closer to the details that make the business run, small-business CIOs are often better equipped to cost-justify technology investments than their brethren at large companies.

Innovation thrives at these smaller companies, which can change business processes and adopt new technologies more quickly than larger organizations. And they are more willing to take risks. This flexibility and decisiveness leads opinion leaders on Wall Street to believe that small companies will be the ones leading the way to economic recovery.

I encourage information technology marketers to take a look at this feature, titled "Working to Scale," beginning on page 36. Small businesses may represent an important target for your marketing efforts in 1992.

Wynne L. Lutz

P.S. Our semi-annual CIO Perspectives conference, "The Business of IT: Finding the Payoff," will convene March 8-11 at Loews Coronado Bay in San Diego. For more information, please refer to the conference brochure included with this issue of the magazine or call our toll-free registration hot line at 800 366-0246.

Coming In CIO

**NEXT MONTH:
FOCUS ON
SOFTWARE**

Tools of the Trade

Packaged software for distributed computing is finally hitting the shelves in significant quantity. But CIOs must be cautious consumers, buying what's right and weighing the risks of associating with new vendors offering unproven products.

Cost Control

CIOs are trying every way possible to stop the runaway train of software costs, from buying more off-the-shelf packages and cutting staff to outsourcing and moving applications to smaller processors. Many are simply making, buying or customizing less software.

Strategic vs. Tactical

While consultants advise thoughtful, strategic planning from the bottom up, CIOs are under pressure to offer interim solutions and keep computing costs down as they enter the distributed era.

The Human Factor

CIOs striving to meet the needs of the immediate future must reexamine their hiring practices, revolutionize their approach to retraining and create a challenging work environment.

Design your own network and save 5-40%.

For more information on *AT&T Software Defined Network International* or *AT&T Global Software Defined Network*, please fill out and mail this Business Reply Card or call:

1 800 448-8600, Ext. 111.

- ☐ Yes, I would like to know more about *AT&T Software Defined Network International*.
- ☐ Yes, I would like to know more about *AT&T Global Software Defined Network*.
- ☐ I currently use network _____.
- ☐ Please send me information about other AT&T International Business Services.

Name _____

Title _____

Company Name _____

Company Address _____

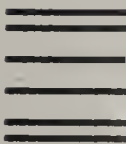
City _____

State _____

Zip _____

Please be sure to include your business telephone number here:

Telephone: (____) _____



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

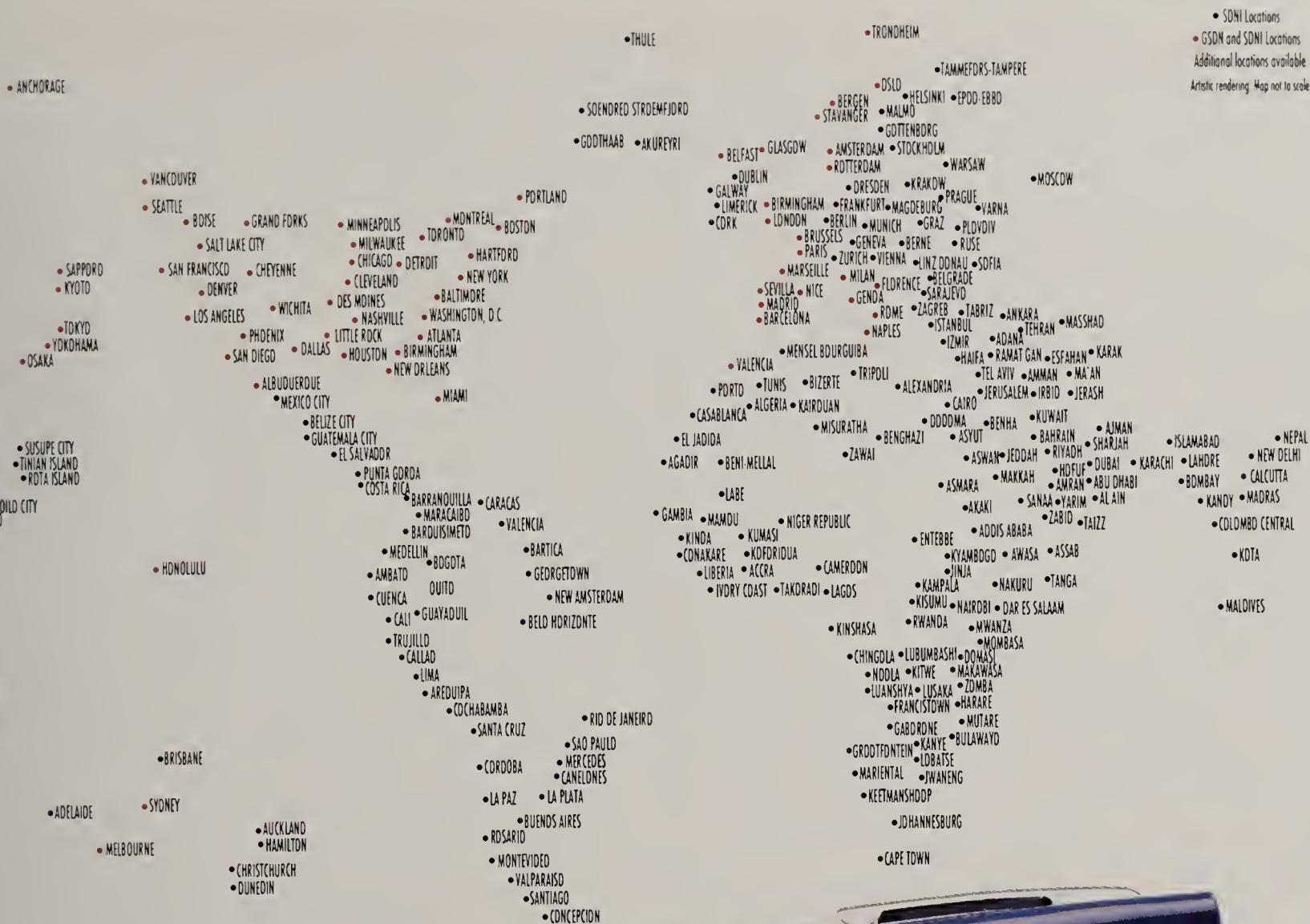
FIRST CLASS PERMIT NO. 86 CHESTER, NJ

AT&T

P.O. Box 721

Chester, NJ 07930-0721





Design your own network.

(And save 5-40%.)

With AT&T you can design your own virtual private network that offers the performance and flexibility of a private network, but without the cost and commitment of dedicated lines—and with the advantages of AT&T's worldwide service.

So if your domestic and international phone bills start adding up to \$10,000 a month or more, AT&T may have a solution for you.

SDNI *Software Defined Network International* adds international reach to 189 locations and countries beyond your U.S. network. If you call foreign company sites, SDNI offers remarkable economy, with convenient dialing and routing options.

GSDN *Global Software Defined Network* creates a virtual private network between your U.S. site and your international site. GSDN handles both inbound and outbound international calls to selected countries, and is

the service of choice if you spend as little as 2 hours per day calling a given international location.

Both services offer such features as unified billing of your U.S. charges, flexible network usage reports, centralized work centers for domestic maintenance and installation, and AT&T's tradition of customer service. And both of them can save you anywhere from 5-40%.

Ask your AT&T representative about SDNI and GSDN. We'll be glad to explain it all and explain how AT&T can help you design a virtual network to almost anyplace you want to call internationally at significant savings.

A World of HelpSM from AT&T.



TRENDLINES

PRODUCT INNOVATION

BIG STEPS FOR THE JAPANESE

Managers in the United States and Europe differ significantly from the Japanese in their promotion and practice of product innovation, according to a recent study by consulting firm Arthur D. Little of Cambridge, Mass. The study's respondents, mainly chief executives and vice

presidents, also threw cold water on the hot topic of Total Quality Management.

Not surprisingly, the survey found that Japanese managers devote more effort to more areas of product innovation than do their American or European counterparts. The Japanese also appeared much more willing

to take bold steps to improve products rather than relying on small incremental improvements.

U.S. managers said that getting products to market on time is their number-one product objective. For Europeans, the key goal is developing new products faster. For the Japanese, product appeal is the chief concern.

American executives most often judge their innovation efforts by measuring profitability and product cost (68 percent). Europeans rate lead time (72 percent) ahead of profitability (66 percent). The Japanese see sales volume as the best evidence of innovation (75 percent), with profitability second (68 percent).

The greatest obstacle to product innovation is a lack of skilled leaders, both U.S. and European managers said. The Japanese, however, view "poorly communicated product vision and objectives" as the biggest barrier. "The Japanese focus on improving the process, whereas U.S. and European companies appear more concerned with people and resource issues," said study director P. Ranganath Nayak, senior vice president at ADL.

Most of the study's 701 respondents have tried to combat these obstacles with multifunctional, autonomous teams. Only 62 percent rated their efforts successful, however. "The real challenge in product innovation is integration of functions across the company and all its systems," Nayak said.

The Total Quality Management approach has also proved disappointing in nurturing integration and teamwork. Of the 54 percent of respondents that had tried TQM, only 36 percent claimed success. The trouble is, "TQM, as implemented in incremental steps, does not provide the capability to redesign or rethink critical high-performance systems," Nayak said. ■

NEW INKLINGS

QDB Solutions Inc., a consulting firm based in Cambridge, Mass., has begun publishing *The Data Quality Newsletter*, a quarterly "dedicated to advancing the state of the art in data quality management." Despite the growing mass of corporate data and its accessibility to growing numbers of users, QDB asserts that the methods for managing data quality and integrity have remained unchanged for decades, creating a number of possible business impairments and liabilities. The newsletter will address ways of coping with these. Call 617 577-9205.

The Electronic Frontier Foundation, also of Cambridge, is a non-profit organization devoted to exploring the technical and ethical boundaries of computer use. EFF, which aims to raise public awareness of the complex constitutional and social issues that could impinge upon the free and open use of computer and telecommunications technologies, now publishes *Effector*, a quarterly newsletter for members, and offers an online bi-weekly electronic bulletin. Call 617 864-1550.

Another quarterly debuted in November. *OPTIV: The Business Journal for Open Systems* is a publication of the Corporation for Open Systems, of McLean, Va., and will focus on the business impact of open systems. The inaugural issue includes stories on how to do business with the federal government and how to finance the costly shift from old to new platforms. Call 800 759-2674. ■

HEATED WORDS AT THE WATERCOOLER

So, maybe it's not quite the World Wrestling Federation, but managers say they are devoting a sharply increasing amount of time to dealing with workplace conflict. This according to a recent survey of executives at the nation's 1,000 largest companies. The survey, developed by Accountemps, a nationwide temporary personnel service, found that managers were spending as much as 13.4 percent of their time—the equivalent of six and a half weeks a year—mediating personality clashes among employees. In 1986 the figure stood at 9.2 percent (four and a half weeks a year).

What accounts for the rise in tensions? The uncertain business climate is a big factor, according to Accountemps Chairman Max Messmer. "There is tremendous corporate pressure to increase productivity with fewer people," said Messmer. Add to this a sluggish economy and widespread marketplace volatility, and you have "a troubling level of job insecurity. If . . . employees do not receive clear delineation of roles and responsibilities . . . , 'turf wars' and conflicts can easily erupt."

According to Messmer, one way of bringing peace to a troubled workplace is to foster a team-based culture in which employees can focus on common corporate goals. ■



TRENDLINES

VIDEO SERIES

LIGHTS! CAMERA! QUALITY!

Markets for most products are now global and intense; power has shifted from sellers to buyers; quality is no longer a luxury—it is a strategy to survive. These are axioms that many managers have taken to heart. But communicating the message to the troops is often difficult; the pressures forcing companies to look long and hard at quality programs seem so abstract and distant. Now there is an easy way to present the argument to the unenlightened—let them watch **QUALITY: THE MOVIE**.

Quality or Else, an engrossing and informative video pitch for quality, could be a handy training tool for some companies. Originally produced as a series for the Public Broadcasting Service (and funded by IBM), the three one-hour tapes focus on economic changes that have made the customer the center of the business uni-

verse, and on quality as a competitive strategy. While these are topics that would normally elicit yawns in the lecture hall or dread on the shop floor, the producers of the series have crafted a colorful, entertaining look at the Age of Quality. Forget those dull overhead tick lists and boring charts: *Quality or Else* takes viewers inside companies, schools and hospitals around the globe.

Issues covered in the videos include the shift from

throughout are interviews with pooh-bahs such as Rosabeth Moss Kanter, editor of the *Harvard Business Review*, and Kenichi Ohmae, chairman of the McKinsey & Co. offices in Japan (and author of *The Borderless World*). This sweeping tour of quality matters also includes visits inside companies such as Harley-Davidson, Florida Power and Light and Procter & Gamble.

The videos, a companion volume and a viewers' guide



regional to international markets, new techniques to achieve improvement, strategic alliances, customer-orientation, and quality in service organizations. The first of the three videos provides an overview; the second looks at change management, the work of W. Edwards Deming and the role of government. The third video focuses on the basics of a good quality program, and on quality in the service sector. Sprinkled

are available (for \$995) from Films Inc., a film-distribution company based in Chicago. The company also rents *Quality or Else* for \$450 a week and plans to release this year a 15-session course study to accompany the videos. Qualityphiles take note: Films Inc. also distributes a number of related videos.

Future reviews of management videos will appear on our "Off the Shelf" page. ■

CALLING ALL CARDS

How many software developers does it take to screw in a light bulb?

Computer jokes are as common as sparrows in the emerging repertoire of techno-humor. But a rarer bird is the authentic CIO joke, whose first sighting was reported in these pages more than two years ago (see "Trendlines," January 1990). Since then we have diligently scoured David Letterman's Top Ten lists and other benchmarks of hip humor, but strangely, no further examples have come to light. Refusing to accept the notion that CIOs are not inherently funny, and in support of our belief that the maturity of a profession can be measured by the body of humor it has generated, we are turning to our readers for help. Send any example of a genuine CIO joke to Joke Search, CIO Publishing, P.O. Box 9208, Framingham, Mass. 01701. The funniest entries will be published in the magazine, and all entrants will receive one of our coveted CIO mugs, which can also be converted into a dribble glass.

Oh yes, the answer to the above riddle is none. That's a hardware problem. ■



A NEW VOICE FOR THE DEAF

While the programming on PBS is sometimes criticized for being inaccessible, no one can say the same for public-broadcasting station WGBH in Boston. The station recently introduced a voice-messaging application for the deaf in order to better serve its audience and employees.

The application, from ROLM of Norwalk, Conn., enables ROLM's PhoneMail system to communicate with a TDD—a terminal designed to relay typed messages over telephone lines. Messages are read on an electronic display or printed in braille.

Previously, if a user called a TDD number and there

was no operator available, that call went unanswered. Now the call is answered by PhoneMail, which sends a greeting and instructions across the screen of the deaf caller. The PhoneMail TDD-mailbox receives and stores the caller's typed message as a series of tones. When receivers see a message-waiting light, they can access the mailbox and play the message, or if their phone does not have TDD support, transfer the message to a TDD terminal where it can be printed or displayed.

The new application should help organizations comply with the Americans with Disabilities Act of 1990, which goes into effect this year. ■

The IEFTM works. For Aetna. For Rhône-Poulenc Rorer.

The success of Texas Instruments I-CASE product is proven—in the field.

There is an integrated CASE product that works. It works now...and it works well.

The IEFTM, or Information Engineering FacilityTM, is in use now by successful companies, large and small, all over the world.

Major gains in productivity, quality, and maintainability.

Productivity gains in initial development are hard to measure, but reports of 2-to-1 improvements are fairly common—and some go as high as 5-to-1.

Quality improvements are dramatic. Users are getting more of what they need to run their businesses. Systems get up and running easier and faster.

As for maintenance, a Gartner Group study showed that, even back in 1990, more than 80% of IEF developers were getting gains of from 2-to-1 to 10-to-1.

Now, develop on PC and generate for DEC/VMS, UNIX. TANDEM, WINDOWS available soon.

The IEF has generated applications for IBM mainframe

environments (MVS/DB2 under TSO, IMS/DC and CICS) since early 1988. Now you can develop systems in OS/2 and automatically generate for DEC/VMS and some UNIX platforms. TANDEM, Microsoft® WINDOWS, and more UNIX will be available soon.

Developers give IEF highest rating in COMPUTERWORLD.

COMPUTERWORLD

magazine's "buyer's scorecard" showed that developers ranked the IEF first among all I-CASE products in the study, particularly in the areas of application quality, programmer productivity, and value for the dollar.

New tutorial provides very fast, friendly IEF training.

We believe our new Rapid Development Tutorial is a breakthrough in CASE training. We gave it the broadest possible beta test—more than 100 companies participated. Developers were able to learn to build systems with the IEF more quickly than ever before—some in as few as five days!

Special "Starter Kit" offer combines new tutorial and full-capability PC toolsets.

The new IEF Starter Kit will give you everything you need to start building systems with I-CASE on your OS/2 PC.

Along with the tutorial, the kit includes our standard OS/2 PC analysis, design and construction toolsets as well as testing and code generation in C. (A COBOL compiler is optional and priced separately.)

There's also 90 days of "hot-line" support.

The kit is priced at \$10,000 (limit one per customer company). That's about one-half the regular cost of the toolsets.

If you're not convinced that the IEF can work for you, here's a chance to see for yourself—at a special low price and (with the new tutorial) in a very short time.

To order an IEF Starter Kit, or for more information, call 800-527-3500.

 **TEXAS
INSTRUMENTS**

Target. Rolls-Royce. Canadian Airlines. Sony.



"Our first major project was a mission-critical foundation system for our Managed Care operation. Conventional development would have taken 1-2 years...with the IEF, we built the first release in only 6 months. The IEF is now our company-wide CASE standard."

Richard F. Connell
VP, Information Technology
AETNA



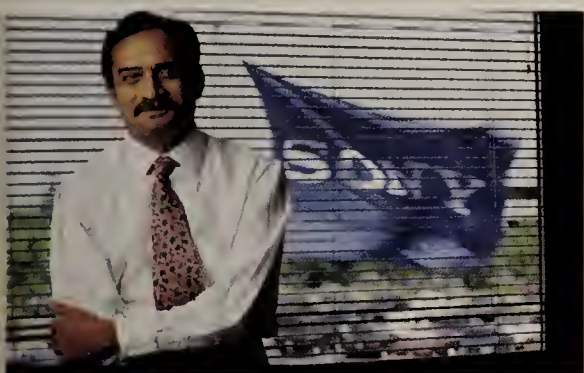
"MERLIN is mission-critical—the most far-reaching business systems initiative we've ever undertaken. Over 400 transactions are in production, with 800 more to be added in the next three months. We could not handle this scale and complexity without IE/IEF."

Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce Aerospace



"With previous methods, we would have had to compromise on an 'okay' 10-screen Lease Accounting system. With the IEF, our users got everything they wanted—an outstanding 40-screen system—in the same time. They are requesting the IEF for all future systems."

Tom Jeffery
Sr. VP, Information Systems
Target



"The IEF offers dramatic improvements in productivity, yet it's easy to learn. One example: We trained 23 developers, including 18 new hires, and then completed a large order processing system—300 transactions—all in only 20 months."

Venkat (Vinnie) Tiruvilumala
Director, CPC/PPC Information Systems
SONY Corporation



"We used an IEF frequent flyer template to build our 'Canadian Plus' system. A major redesign, estimated at 4-6 months using previous methods, took less than a month. Now we're providing better customer service, and maintenance costs are greatly reduced."

Bill Palm
President, Canadian Technology Services
Canadian Airlines



"Our new Customer Order Services Marketing Information System—over 500 transactions and 250 entities—is in production. Quality is excellent and our users are very pleased. Dedicated people armed with the IEF advantage have made COSMIS a success."

James R. Engle
Director, Systems and Programming
Rhône-Poulenc Rorer



"Your new IEF tutorial was a way to quickly become familiar with the IEF and see how the IEF will allow quality systems to be built very quickly. I feel I now know how to build systems using the techniques described."

Roger Strand
Application Development Consultant
First Federal Lincoln



"The IEF tutorial is very well done. I feel comfortable with this software and I have acquired the skills to build simple systems. The tutorial is a very fast and effective means of evaluating the capabilities of the IEF."

Margaret Kubaitis
Research Programmer, IS&S
University of Illinois



"The IEF tutorial is put together very well and quickly illustrates how to construct a system using the IEF. It gives one the basics to start getting the job done. I feel I am prepared now to build simple systems using the IEF."

K. E. Peacock
Data Administrator
City of Saskatoon, Saskatchewan

Ordering Out for IS

Despite a hesitancy to cede control of IS resources, CIOs are intrigued by the potential benefits of outsourcing

BY JULIE SCHWARTZ

While outsourcing professional and systems-integration services has emerged as an important IS management strategy in the 1990s, CIOs question whether outsourcing will actually reduce costs and improve their return on investment. Proponents point to many virtues, such as access to new technology, cost predictability, asset redeployment, and cost-effectiveness. Many IS executives, however, may be threatened by a loss of control or even their jobs and resist outsourcing outright. Some feel that by re-engineering their services, they can reduce costs without the help of an external vendor.

These are some of the results of a recently released study by Ledge-way/Dataquest, a market-research and custom-consulting firm in Framingham, Mass. In the spring of 1991, over 500 CIOs and IS directors of Fortune 1,000, government and public-sector organizations were asked about their current sources of professional and systems-integration services, their willingness to outsource these services, and the benefits they hoped to achieve.

The Decision

While companies are opting to outsource professional and systems-integration services in increasing numbers, there remains a strong preference among the majority to manage and provide these services in-house. Even when companies do choose to contract with external vendors, they usually do so in conjunction with in-house resources, thus sharing the responsibility. These organizations are caught in a balancing

Most Likely To Be Outsourced

- Custom-Application Development
- Software Support/Migration Planning
- PC/Workstation Configuration
- Disaster Planning and Recovery
- Education and Training

Least Likely To Be Outsourced

- Facilities Management
- Security
- Help-Desk Services
- Transaction Processing
- Project Management Services

act between their need for technological expertise and skilled labor and their desire to maintain control over their information technology assets.

Organizations are most willing to outsource services when doing so will enhance their skill levels or supplement their limited technical resources. (See box.) They are disinclined to give up management tasks that they perceive as critical to maintaining control of their information systems. Service-buying behavior is not static, however, and IS organizations unwilling to outsource services today may decide to do so tomorrow. The same holds true for any given service.

Benefits

Organizations seek both strategic and tactical benefits from professional and systems-integration services. However, benefits are usually tied to limited or nonexistent resources and are more tactical in nature.

IS executives perceive the primary benefits of contracting for professional services to be: gaining knowledge and expertise, cited by 53.6 percent of the respondents, and sup-

plementing constrained labor resources, cited by 39.8 percent. Cost savings is mentioned by less than 20 percent of the respondents, and improving financial performance is mentioned by less than 5 percent.

Strategic benefits mentioned include reducing the time management spends on IS operations, allowing managers to redirect their energies into the organization's core business (12.8 percent); and sharing the risk (5.8 percent). Roughly half of the respondents said they

expect no cost savings over using in-house staff. Many (68 percent) consider outsourcing as an alternative to staff increases, especially for short-term projects.

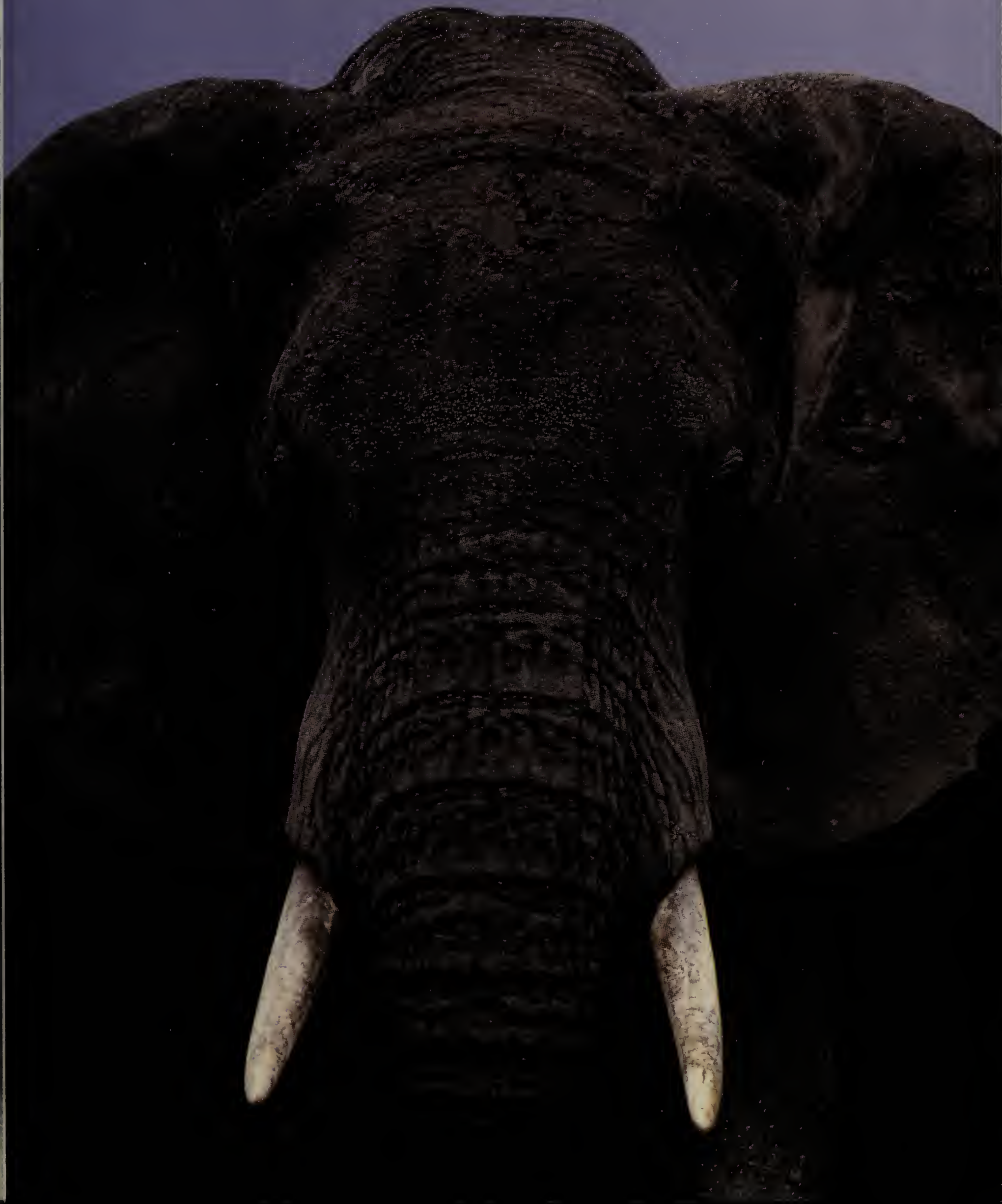
Drawbacks

Respondents identified three primary drawbacks: higher than expected cost (cited by 39.8 percent), loss of in-house expertise (36 percent) and loss of control (31 percent). With regard to costs, IS executives are reacting less to contract prices that change than to the hidden costs that the contracts do not take into account, including unanticipated staff involvement, training, required insurance and accounting procedure changes.

Loss of in-house expertise is another genuine concern. By outsourcing, IS executives forgo developing their internal expertise in favor of "renting" the expertise of others. Many perceive this as a vulnerable position. ☐

Julie Schwartz is associate director at Ledge-way/Dataquest, a market-research and custom-consulting firm in Framingham, Mass.

**CAN AN 8,000 LB. ELEPHANT
OUTRUN THE GAZELLES?**



STAND

Introducing Desktop

At the risk of understatement, Desktop Direct from Digital is about to shake up the PC industry. Because we believe that a PC company should be low cost—but not lightweight.

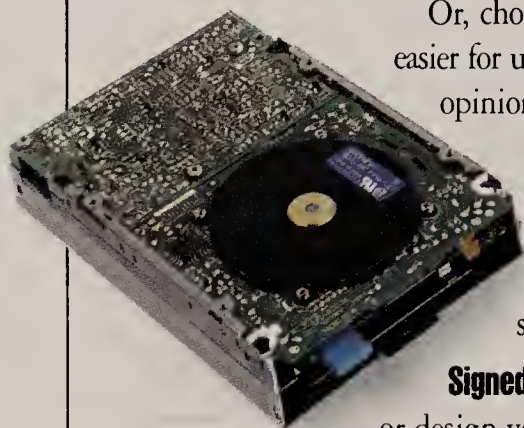
We will deliver world class PCs—without proprietary surprises. Premier PC components and operating systems put together exactly the way *you* want them.

Because Desktop Direct doesn't think you should have to sacrifice choice for cost. And because the only PC standard we're interested in is yours. Give us your specs and we'll do it *your* way. At no extra charge.

Or, choose from a range of pre-configured PC packages at *amazing* prices. Not because it's easier for us, but because you asked for them—in focus groups, surveys, questionnaires and opinion polls.

So size us up. You'll be impressed by our open-minded philosophy towards service. For example, Desktop Direct from Digital offers Multivendor Service that includes Apple®, Intel, Microsoft, IBM® and Dell®.

In short, industry-leading Intel-Microsoft systems. Comprehensive support from a corporation you can count on. At prices that will start a stampede.



Signed, sealed, delivered—and supported. Whether you purchase our ready-to-run PCs or design your own, your system can be on its way to you within 48 hours of the receipt of your order. Already loaded with your choice of operating systems. And backed by a 30-day money-back guarantee.

But that's just for starters. When you purchase a PC from Desktop Direct, you're backed by expert Digital Services personnel. Besides free on-site service with no fine print for a year after the purchase of a PC, our own 10,000 plus Digital Service Representatives can provide you with installation, systems integration and networking expertise.

Open for business—your business. Any techie will attest that our Intel i386 and i486 microprocessors are the best in the business. And any MIS manager will be happy that our standard bus architecture and expansion slots won't tie you to proprietary solutions. Because at Desktop Direct from Digital, "open systems" means just that: the ability to mix and match PC hardware and software to build information systems that meet business needs.

In fact, we've been meeting the stringent demands of big business for years. And that's great experience for your business. Put us to the test today.

- ✓ Free One Year On-Site Service with No Fine Print
- ✓ Free Technical Support Line
- ✓ Multivendor Support for Hardware and Software
- ✓ Free 24 Hour FAX Support
- ✓ Free Electronic Connection Modem Information
- ✓ Free Factory Installed Operating System
- ✓ Free Freight
- ✓ PC Training for the World Ahead



Call Desktop Direct from Digital
1-800 PC BY DEC (1-800-722-9332)
Please reference AHK when you call.
Mon-Fri 8:30am to 8:00pm (ET)

BACK.

Direct From Digital.

Service

When your "help" key can't cut it, we can. Mon.-Fri. 8:30am to 8:00pm (ET) Our Technical Sales Representatives put you in touch with software specialists, programming professionals and hardware wizards. All with a single call.

Networking

Digital. Need we say more? We don't just sell Novell Netware™, Microsoft LAN Manager™ or Digital PATHWORKS™—we offer our networking expertise in design, service and support.

Operating Systems

DOS and Windows™ are a winning combination. They're pre-installed in our PCs—and ready to run your most important applications.

Multivendor Support

Because in business, no PC is really a "stand-alone". We go the extra mile. Our Multivendor Support plan can consolidate your maintenance agreements and service contracts. We back the best names in the PC business: Intel, Microsoft®, Apple®, IBM®, Dell®, Ashton-Tate. Because we're about to make PC maintenance seamless. Now.

Keyboard

The Digital Gold™ keyboard is available with some systems.

SVGA

We're SVGA-ready, so you're set for the next generation of PC graphics. In the meantime you get crisp color or monochrome VGA graphics. And with the DECpc 433w special processor you'll have the fastest available pixel or coordinate-based graphics anywhere. That's right: the fastest.

Price

Priced to compete and win, without sacrificing quality, compatibility or power. That's Desktop Direct from Digital.



Standard bus

Someone once said, that best surprise is no surprise. Especially when it comes to PCs. No oddball bus architecture here. Just standard—and powerful—components and quality Digital engineering.

Expansion

Start with a system that's lean and mean, and move up to more muscle when you're ready. Plug in up to 16MB of memory. Add fixed disks to the 3.5" and 5.25" storage bays. It's up to you.

Microprocessors

Intel engineering sets the pace. And we keep you up to speed—from the sleek i386sx-based DECstation 316sx to the ultra-fast i486-based DECpc 433 Workstation.

**DESKTOP
DIRECT
from
DIGITAL**

Taking PCs into the world ahead

digital™

Intel and 80486 are registered trademarks of Intel Corporation. Microsoft Windows, and DOS are trademarks and MS-DOS is a registered trademark of Microsoft Corporation. Novell is a trademark of Novell Corporation. Apple is a registered trademark of Apple Computer, Inc. Dell is a registered trademark of Dell Computer Corporation. Compaq is a registered trademark of COMPAQ Computer Corporation. AST is a trademark of AST Research, Inc. The DIGITAL logo, DECstation, DECpc and PATHWORKS are trademarks of Digital Equipment Corporation.

LEADER OF

DECpc 320sx



Includes:
Microprocessor: Intel i386 running at 20MHz
Memory: 1MB, 80ns Memory Kit
Storage: 52MB IDE Hard Disk Drive
Resolution Mode: 1024 X 768 SVGA Adapter
Display: 14" VGA Color Plus Monitor
Keyboard: 101-key Keyboard
Mouse: Mouse
Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

Special Package Price **\$1,899**
(DJ-PC443-03)

DECpc 333c



Includes:
Microprocessor: Intel i386 running at 33MHz
Memory: 4MB, 80ns Memory Kit
Storage: 52MB IDE Hard Disk Drive
Resolution Mode: 1024 X 768 SVGA Adapter
Display: 14" SVGA Color Monitor
Keyboard: 101-key Keyboard
Mouse: Mouse
Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

Special Package Price **\$3,199**
(DJ-PC463-06)

DECpc 433 workstation



Includes:
Microprocessor: Intel i486 running at 33MHz
Memory: 8MB, 80ns Memory Kit
Storage: 40MB IDE Hard Disk Drive
Resolution Mode: 1280 X 1024 TIGA Adapter
Display: 20" Color Monitor
Keyboard: 101-key Keyboard
Mouse: Three-button Logitech Mouse
Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

Special Package Price **\$5,999**
(DJ-PCW10-BB)

THE PACKS.

DECpc 316sx



Includes:

Microprocessor: Intel i386 running at 16MHz
Memory: 1MB, 80NS Memory Kit
Storage: 52MB IDE Hard Disk Drive
Resolution Mode: 1024 X 768 SVGA Adapter
Display: 14" VGA Color Plus Monitor
Keyboard: 101-key Keyboard
Mouse: Two-button mouse
Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

Special Package Price **\$1,799**

(DJ-PC444-03)

DECpc 325c



Includes:

Microprocessor: Intel i386 running at 25MHz
Memory: 4MB, 80NS Memory Kit
Storage: 52MB IDE Hard Disk Drive
Resolution Mode: 1024 X 768 SVGA Adapter
Display: 14" VGA Color Plus Monitor
Keyboard: 101-key Keyboard
Mouse: Two-button Mouse
Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

Special Package Price **\$2,949**

(DJ-PC462-04)

DECpc 433 workstation



Includes:

Microprocessor: Intel i486 running at 33MHz
Memory: 8MB, 80NS Memory Kit
Storage: 209MB SCSI Hard Disk Drive
Resolution Mode: 1280 X 1024 TIGA Adapter
Display: 20" Color SVGA Monitor
Keyboard: 101-key Keyboard
Mouse: Three-button Logitech mouse
Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

Special Package Price **\$6,699**

(DJ-PCW10-DB)

**DESKTOP
DIRECT
from
DIGITAL**

Taking PCs into the world ahead

1-800 PC BY DEC (1-800-722-9332)
Please reference AHK when you call.

PUT YOUR PC TOGETHER ON PAPER.

FAX

TOLL FREE TO
1-800-524-5694

and we'll send you
a special system
recommendation.

Or call

1-800-722-9332

and we'll recommend
by phone.

OPEN
For Business

DESKTOP DIRECT from DIGITAL

Taking PCs into the world ahead

digital™

Intel and 80386 are registered trademarks of Intel Corporation. Microsoft Windows, and DOS are trademarks and MS-DOS is a registered trademark of Microsoft Corporation. Novell is a trademark of Novell Corporation. Apple is a registered trademark of Apple Computer, Inc. Dell is a registered trademark of Dell Computer Corporation. Compaq is a registered trademark of COMPAQ Computer Corporation. AST is a trademark of AST Research, Inc. The DIGITAL logo, DECstation, DECpc and PATHWORKS are trademarks of Digital Equipment Corporation.

Your Name _____

Title _____

Company Name _____

Address _____

City _____

State _____

Zip _____

Office Telephone No. _____

Your FAX No. _____

If you have an idea of the PC specs you need, just jot them down in the blanks provided and we'll recommend a system that's right for you.

☐ Here are my specs. Now call me with my new system recommendation.

Customization Worksheet

Your base system is a: ☐ 286 ☐ 386 ☐ 486 ☐ Other

How many applications will your PC(s) run in a typical workday? _____

What best describes the type of work the system will be used for?
(Check all that apply):

- | | | |
|--|---|--|
| ☐ Word Processing | ☐ Desktop Publishing | ☐ Scientific Research |
| ☐ Order-entry | ☐ Education | ☐ Software Development |
| ☐ Database (filing records) | ☐ Design (CAD/CAM) | ☐ E-Mail |
| ☐ Financial Calculations | ☐ Engineering | ☐ Other industry-specific applications (please specify) |
| ☐ Retail Store Management | ☐ Industrial Process Control | |

How many people work in your group, department or small business?

☐ Less than 10 ☐ 10-20 ☐ 20-35 ☐ More

Is your operating system:

☐ DOS ☐ DOS with Windows ☐ OS/2 ☐ MAC ☐ UNIX™ ☐ Other

Questions:

Which of the following graphics-oriented applications best describes your needs?
(Check all that apply)

- | | | |
|---|--|--|
| ☐ Desktop Publishing | ☐ Realtime Modeling | ☐ AutoCad |
| ☐ CAD/CAM | ☐ Animation | ☐ Business Graphics |
| | ☐ Image Processing | |

LAN Manager

How many PCs do you have installed? _____ From how many manufacturers? _____

What kinds of connections does your PC(s) require? (Check all that apply)

- ☐ Links with other PCs in the immediate surroundings
☐ Connection to the local area network (LAN) throughout a building
☐ A line to a host system in a remote location

What kind of media (cable) is used in your LANs today? _____

What is the networking software now being used in your company? _____

What kind of host system will your PC communicate with?

☐ DEC ☐ IBM ☐ Other _____

What Kind of Service Do You Really Need?

- ☐ On-site Hardware Support ☐ Software Support ☐ Telephone Support
☐ Training ☐ FAX Hotline

How many of your users take portables on the road? _____

Do you currently have a service contract(s) for your PCs? ☐ How many? _____

1-800 PC BY DEC (1-800-722-9332)

Please reference AHK when you call.

Support Groups

A third-party software escrow arrangement ensures vendor support for critical applications

BY ADELE KALAS

Today's corporations are frighteningly dependent on the business decisions and financial condition of their software vendors. No longer limited to back-office applications, licensed software is increasingly integral to the manufacture and delivery of corporate products, information and services. At risk are billions of dollars in lost revenue and product-redevelopment costs if vendor support deteriorates or is terminated for any reason.

The software vendor-user relationship is a partnership that depends upon consistent delivery of support over many years. But a long-term commitment is often at odds with the vendor's need to redirect its strategy and resources in a changing competitive market. User com-

panies will have to educate themselves and struggle against vendor resistance if they hope to protect their software investments.

Control of licensed-software risks begins with the decision to acquire a critical software tool or application. Many companies have difficulty deciding which software requires protection (see box). To the extent that the risk can be quantified, a ratio between the cost of the protection and the level of risk can be developed, and standard risk tolerances applied. Assigning values may not be necessary, however, since the actual cost of risk-control programs is very low. Companies that routinely implement risk control find that the greatest cost is the increased negotiation time with vendors.

The purpose of risk-control negotiations is to ensure that the company will have access to proprietary support materials if the vendor fails to support the software for any reason. Successful negotiations will result in a clear statement of what constitutes a complete set of support materials, legal clauses to assure that the materials can be released to the user in a timely manner, and the selection of a qualified administrator to maintain the arrangement over many years.

An escrow arrangement managed by a qualified third party is preferable to in-house arrangements because it assures that update activity will be monitored and that the materials will be protected from infringement by company employees. But escrow only works when the user negotiates the technical, administrative and legal terms of the arrangement. The company should not accept vendor-supplied agreements or escrow agents without evaluating its rights based on full knowledge of these requirements.

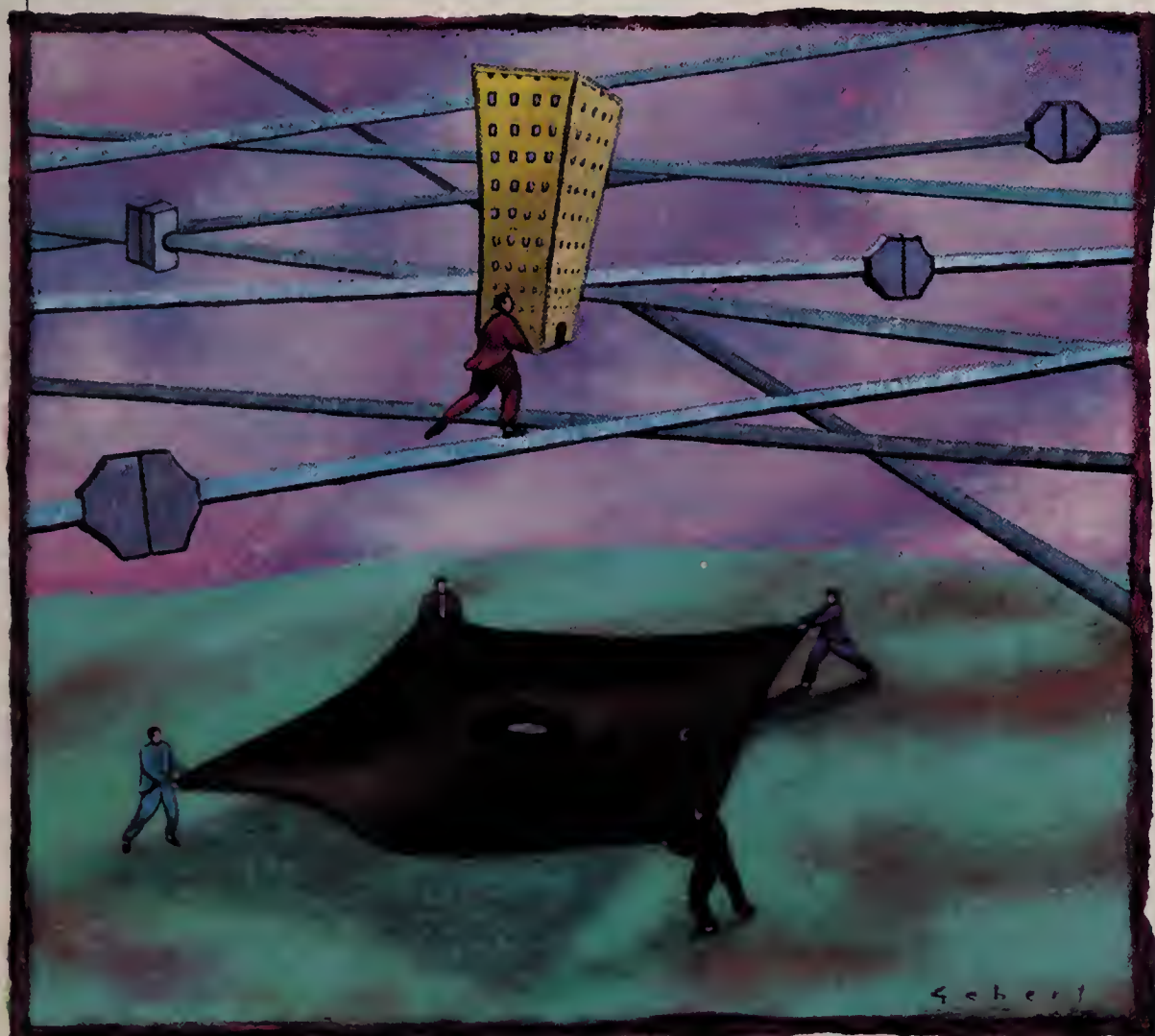


ILLUSTRATION BY WARREN GEBERT

To assure the technical basis of the protection arrangement, the user company needs to define the contents of the escrow deposit. The company's technical staff should participate in this definition as if this were a current acquisition of the source code for modification and/or maintenance. The entire operating environment in use by the vendor's maintenance staff must be documented. Any third-party software used in developing or maintaining the product must be identified, and information about how to license this software if it is needed for maintenance should be included.

In situations where re-engineering the code would be very costly or where timing is of the essence, the escrow agent should technically verify the contents of the deposit. A complete verification will require that the agent's technical staff compile the deposited materials and deliver the resulting code to the company for comparison. Only then can the company be certain that the vendor did not inadvertently overlook vital information.

The company will need a contract to document the escrow arrangement, but the contract itself will only be useful in the event of litigation. The courts are too slow to protect the company's urgent need for access to software-support materials. The real protection is derived from the agent's role in managing the deposited materials to make sure that they are current and readily available. A qualified escrow agent will assure the status of the arrangement, maintain records of updates to the deposit, and report all activities to the user company.

At a minimum, the vendor should agree that the materials can be released to the company if support, as defined in the license agreement, is terminated for any reason. The most favorable protection arrangement will allow the company to access the deposited materials if it determines that support is unacceptable.

The arrangement must specify that the company has the right to ask the escrow agent to release the materials when a triggering event has occurred. The agent receives the user company's request and notifies

the vendor of the pending release. If the vendor does not dispute the event within a specified period, the agent may release the materials.

If a dispute does occur, the best arrangements allow the agent to release the materials to the company until the dispute can be settled. Since the company is restricted to using the materials to support the license agreement, this does not threaten the vendor's ownership of the proprietary materials. A 10- to 60-day arbitration clause should bring disputes to rapid settlement, with the materials returned to the escrow agent if the arbitrator finds in favor of the vendor.

The greatest threat to the ongoing integrity of the escrow arrangement is nonpayment of annual fees to the agent. Companies will achieve the best protection by paying these fees themselves; if the vendor pays the fees, the agent should notify the company in the event of nonpayment. Then the user company must have the option of making the payment to keep the arrangement in force.

A 1988 change to the bankruptcy law protects the license agreement after a bankruptcy filing and affords the same protection to the escrow contract if it is supplementary to the license agreement. In addition, the escrow agent may take title to the *copy* of the materials in the deposit, further assuring that the bankruptcy trustee will not interfere with the company's rights to the support materials.

All three parties—vendor, user and agent—should sign the escrow contract. If the contract is between the vendor and the escrow agent alone, the company will not be able to get the materials released without going to court.

At least annually, the company should reevaluate the risk level for each software package. The outcome of the analysis may direct the company to evaluate and strengthen its protection arrangements. Deposited materials can be technically verified, and escrow-agent records compared to current user release levels. The company may determine that increased dependence on certain software or vendors is unwise and be-

Assessing the Risk

Organizations should conduct an annual evaluation of software licenses to help predict the risk of support loss and estimate the impact of such loss on operations. This evaluation should include the following:

► **How important is the software to the company?** Is it vital to an operation that directly affects customers? Does it interact with other software that is critical? Is it widely distributed throughout the company? Is it resold as a part of a company product? Would downtime of more than two days affect operations?

► **What is the cost of replacement?** This should take into consideration license fees (including customization and maintenance); the costs of personnel training; conversion; alternative processing methods used during conversion; facilities and equipment used solely with this product; and loss of revenues due to business disruption.

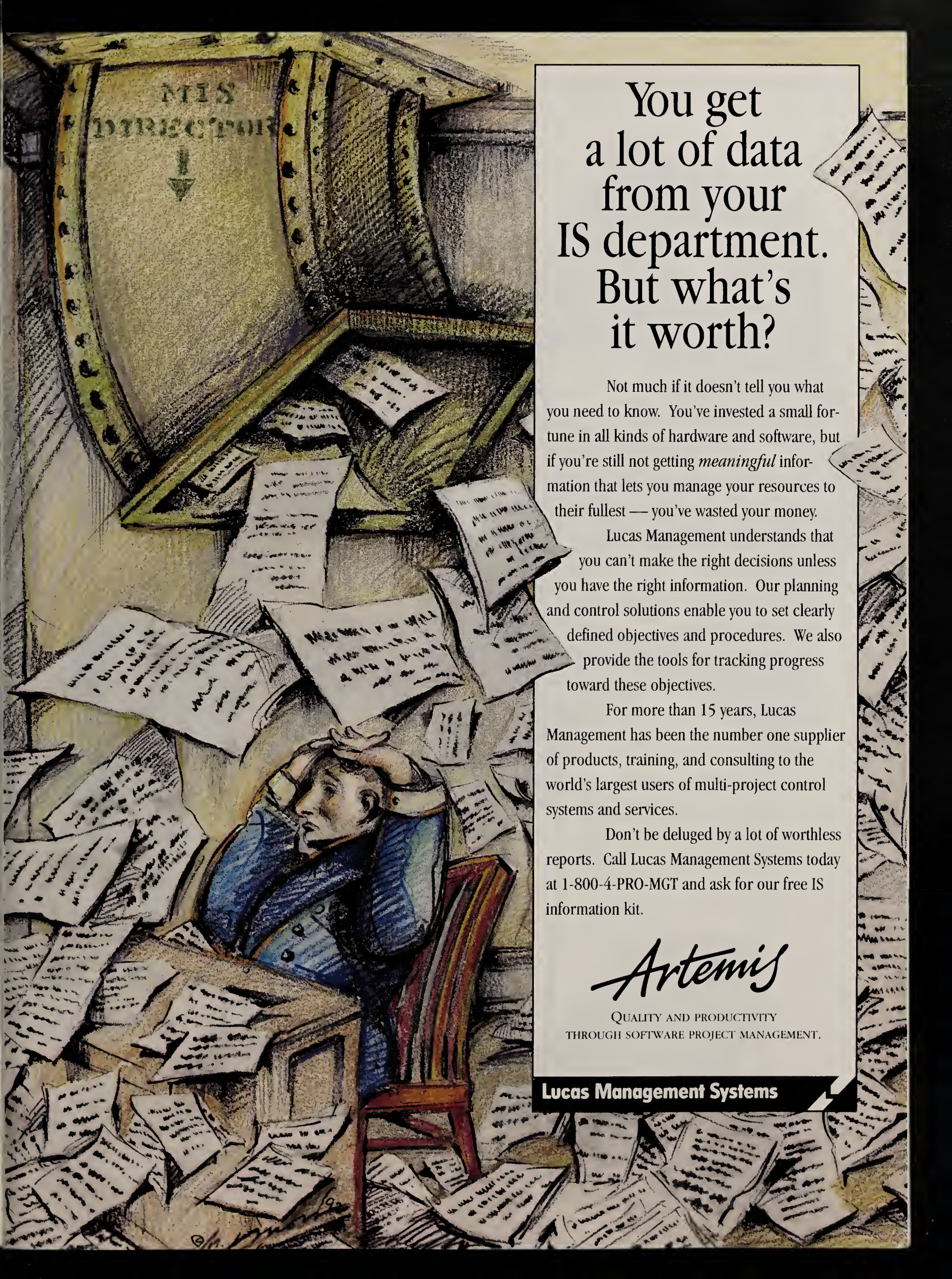
► **How great is the potential for support failure?** What is the size of the vendor support staff for this product? How old is the product (maturity in life cycle)? What is the financial condition of the vendor? Is the vendor a potential acquisition/merger target?

—A. Kalas

gin plans for conversion.

Periodic evaluation of risk and use of escrow as leverage should minimize the possibility that the company will ever lose support for its licensed software. ☐☐

Adele Kalas is vice president of Data Securities International, a software escrow company headquartered in San Francisco.

A detailed illustration of a man in a blue sweater sitting in a wooden chair, completely buried up to his chest in a chaotic, towering mountain of papers and documents. The papers are scattered everywhere, some on the floor, some on the desk, and some floating in the air. In the background, a large wooden cabinet or filing system is visible, with one of its doors open, revealing more papers inside. The overall scene conveys a sense of being overwhelmed by a massive amount of data or paperwork.

You get a lot of data from your IS department. But what's it worth?

Not much if it doesn't tell you what you need to know. You've invested a small fortune in all kinds of hardware and software, but if you're still not getting *meaningful* information that lets you manage your resources to their fullest — you've wasted your money.

Lucas Management understands that you can't make the right decisions unless you have the right information. Our planning and control solutions enable you to set clearly defined objectives and procedures. We also provide the tools for tracking progress toward these objectives.

For more than 15 years, Lucas Management has been the number one supplier of products, training, and consulting to the world's largest users of multi-project control systems and services.

Don't be deluged by a lot of worthless reports. Call Lucas Management Systems today at 1-800-4-PRO-MGT and ask for our free IS information kit.

Artemis

QUALITY AND PRODUCTIVITY
THROUGH SOFTWARE PROJECT MANAGEMENT.

Lucas Management Systems



Rumor has it that the connectivity jungle may have produced a new king of the beasts—the Chief Networking Officer. Does the genuine article exist, or is it just a phantom of the executive suite?

LOOKING FOR NETWORKING'S MR. BIG

AS CONNECTIVITY BECOMES

an increasingly crucial (and often complex) issue within companies, are the managers who have responsibility for all this technology gaining visibility among their corporations' senior managers? Are they ascending a rung or two on the organizational ladder? Are they getting fancy new titles? And does there exist such a being as a chief networking officer?

A chief networking officer! It seems unthinkable that any organization would elevate the PC and telephone administrator to a top corporate spot. Yet, once it was unthinkable to knight the person who bought mainframes and fretted about standards and architecture. Times change. Rumors abound that a few network managers enjoy an elevated status in their respective companies, and a 1991 telecommunications meeting sponsored by the Technology Transfer

Institute was touted as a "Chief Networking Officers' Forum." But stalking the corporate landscape in search of a chief networking officer can prove to be not unlike a trek to photograph Big Foot.

Banks seem a likely place to begin the hunt. After all, banks are gluttons for technology. If the communications equivalent to the CIO is to be found anywhere, surely it is amid the tangled information pipes connecting deposits and loans.

No such luck. "Chief networking officer? That's a brand new term to me," said Jeff Speight, senior vice president of communications at New York's National Westminster Bank. Speight, who reports to another senior vice president, who in turn reports to Robert Chapman, the bank's CIO, chuckled at the very thought



THE ASSOCIATION FOR COMPUTING MACHINERY PROUDLY PRESENTS



THE COMPUTER MUSEUM'S 1992 COMPUTER BOWL

FRIDAY MAY 1, 1992

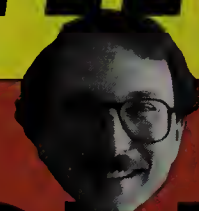
THE HASSLE IN THE CASTLE

ANOTHER TECHNICAL KNOCKOUT



CHARLIE
"JOHANN SEBASTIAN"

EAST vs WEST



JOHN F.
"FUTURE"

BACHMAN vs SHOCH

Captain, Bachman Information Systems, Inc.

Captain, Asset Management Company

BILL "THE ELBOW"

MACHRONE

Ziff-Davis Publishing Company



VS



JEFF "THE KILLER"

KALB

MasPar Computer Corporation



DR. DAVID L.

"HALF" NELSON

Fluent Machines Inc.

RUTHANN

"THE MIGHTY"

QUINDLEN

Alex. Brown & Sons



ANDY "M.C."

RAPPAPORT

The Technology Research Group, Inc.



VS



VERN "THE ACE"

RABURN

Slate Corporation

THE EXAMINER
BILL GATES
Microsoft Corporation



PAUL "BEARER"

SEVERINO

Wellfleet Communications, Inc.

VS

DR. JOHN E. "KNOCK KNOCK"

WARNOCK

Adobe Systems, Incorporated



LIVE SITE THE PARK PLAZA CASTLE
BOSTON, MASSACHUSETTS



CLOSED CIRCUIT SITE

XEROX PALO ALTO
RESEARCH CENTER,
CALIFORNIA

This is the rematch fans have been waiting for all year. Ever since the last action-packed Technical Knockout, the West has been clamoring for another go at the Champions from the East. On May 1, they'll get their chance to lace 'em up.

Join us at live at ringside or at the closed circuit site for all the blow by blow excitement of *The Hassle In The Castle* - The Computer Museum's 4th Annual Computer Bowl. It's sure to be *Another Technical Knockout*.

Presenter

The Association for Computing Machinery

Underwriters

Apple Computer, Inc.
Digital Equipment Corporation

Judges

Pamela McCorduck
Author
Heidi Roizen
T/Maker Company

Founders

Pat Collins Nelson &
Dr. David L. Nelson

Official Sponsors

Bank of Boston
The Bank

BASF Information
Systems
The Diskette

Intel Corporation
The Microprocessor

MasPar Computer
Corporation
The Massively Parallel
Computer Company

Merrill, Pickard,
Anderson & Eyre
The Venture Capital Firm

Price Waterhouse
The Accounting Firm

Radius Inc.
The Systems
Enhancement Company

Robertson,
Stephens & Co.
The Investment Bank

Stratus Computer, Inc.
The Transaction
Processor

Visix Software Inc.
The High Performance
Workstation Software Co.

Wellfleet
Communications, Inc.
The Internetworking
Company

Promotion

PARTNERS & Simons

The Computer Bowl is broadcast on the PBS series, Computer Chronicles, hosted by Stewart Cheifet. The Computer Bowl is a project to benefit the educational programs of The Computer Museum, 300 Congress St., Boston, MA 02210.

For tickets and sponsorship information 617-426-2800 ext. 346.

Engraving

HK Graphics

DIVIDE & CONQUER RIGHT DOWNSIZING

Corporate Computing

INTERNATIONAL CONFERENCE & EXPOSITION

April 27-May 1, 1992 ■ Los Angeles, California

DIVIDE

Downsizing/Rightsizing means migrating selected main-frame and minicomputer-based business applications to platforms of network-based microcomputers and workstations that operate within a client/server architecture.

CONQUER

Downsizing/Rightsizing means tremendous cost savings, system flexibility, user-friendly interfaces, stronger bonds between business managers and IS organizations, and enhanced productivity - adding up to a *competitive advantage*. The **Downsizing/Rightsizing Conference** is the industry's most comprehensive educational event. It is designed to provide the relevant and objective information you need to profit from the industry's latest technical advances.

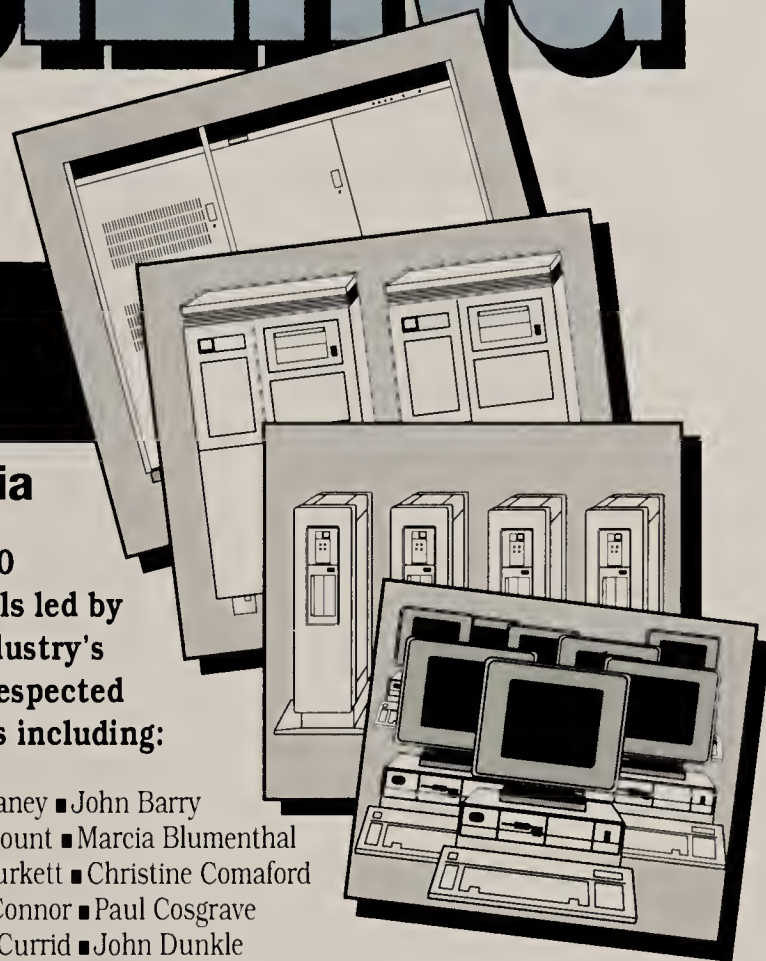
Conference tracks:

- Client/Server Architectures ■ Managerial, Financial, and Organizational Issues ■ Networking and Downsizing Technologies ■ Corporate User Studies
- Windows Applications ■ Systems Development

Over 50
tutorials led by
the industry's
most respected
experts including:

- Lucy Baney ■ John Barry
- Jack Blount ■ Marcia Blumenthal
- Paul Burkett ■ Christine Comaford
- David Connor ■ Paul Cosgrave
- Cheryl Currid ■ John Dunkle
- Frank Dzubeck ■ Richard Finkelstein ■ Howard Fosdick
- John Gallant ■ Jerrold Grochow ■ Lawrence Hambly ■ Tom Kieffer
- Theodore Klein ■ Dominique Laborde ■ Robert McDowell
- Dennis McEvoy ■ Ronald Peri ■ Bill Raduchel ■ John Sifonis
- Ken Wasch ■ William Zachmann, and more.

The **Downsizing/Rightsizing Exposition** will feature the latest tools and technologies you will need to implement Downsizing/Rightsizing in your organization. Some of the companies you can expect to see include: Andersen Consulting, AT&T, Compaq, Computer Associates International, Cooperative Solutions, Data Access, D. P. Specialists Development, Encore Computers, Hewlett-Packard, IBM, Legent, Marathon Systems, Novell, Prologic, Santa Cruz Operation, Sun Microsystems, Tricord, and more.



Sponsored by



Boston
University
Corporate
Education
Center

72 Tyng Road
Tyngsboro, MA 01879

**COMPUTER
ASSOCIATES**
Software superior by design

NETWORK WORLD
The Authority on Networking Strategies

DBMS

Cosponsored by



SUN
microsystems

COMPAQ



Boston Systems Group, Inc.

**PC
MAGAZINE**

CIO

To register, or to receive a detailed brochure, please call
1-800-733-3593, ext. 255.

For information on exhibiting,
call 1-800-733-3593, ext. 294 or ext. 261.

Two networking trends are adding more confusion and fragmentation to the picture. Some companies are simply outsourcing the whole perplexing mess; others are driving responsibility for communications down to the business units.

.....

of the title. "It sounds like something we [communications managers] should create to justify our own existence," Speight said.

Speight confessed that his own responsibilities have changed in recent years. He began his career in data processing, then followed the evolution of hardware into communications technologies in the early 1980s. Today he manages the bank's data and voice communications, network operations, office-automation support and data security. But increasingly, Speight finds himself working shoulder to shoulder with business units and other technology staff to develop strategic business applications on the network.

The job is quite different elsewhere in town, at Bankers Trust Co. in New York. Michael Packer is the network colonel but his title is senior vice president of technology strategic planning, and his responsibilities are eclectic—including architecture standards, the human-resources functions for technology, financial-planning analysis, the systems-engineering group and technology business consulting. He also comanages global telecommunications with an executive from the bank's global-market business unit. Packer reports directly to the bank's chief technology officer, Carmine Vona.

In general, Packer believes, the future for telecommunications managers lies in some hybrid of communications and operations. "Clearly, the telecommunications function is moving closer to a connect function—which takes you into PC LANs and the data center," Packer said. He doesn't foresee the advent of the chief networking officer—has never even heard of such a thing.

There certainly is *not* such a thing as a chief networking officer," said Marty Hyman, vice president of the information industry group at Booz-Allen & Hamilton in New York. Sure, telecommunications management is becoming a more important issue within the corporation, Hyman said, and yes, business acumen has become a requirement for network managers, "but there are a diversity of reporting and responsibility solutions here." Today's

telecommunications managers have emerged from the technical-services group, software development, data center or other technology divisions, and they report to a variety of IS or administrative managers at all levels. "It's a very mixed bag," Hyman said.

Carl Pitasi, vice president and director of Enterprise Network Strategy Services at the Gartner Group Inc. in Stamford, Conn., sees two networking trends that can only add more confusion and fragmentation to the picture. Some companies are simply outsourcing the whole perplexing mess; others are driving responsibility for communications down to the business units. What happens to the network officer? He or she might "remain on the staff up top in the corporate office, or find a job in the P&L unit—or end up on the street," Pitasi said.

That hardly seems like the right petri dish for cultivating a new executive strain. "Maybe a chief networking officer will make sense in the 1994 or 1995 time frame," speculated Paul F. Kirvan, a principal at a Turnersville, N.J., telecommunications consultancy that bears his name. Telecommunications managers are just now catching the attention of senior managers, so the executive suite is just a glimmer on the horizon. "For a long time, management will feel that if there is a top technology position, the CIO is it, with telecommunications reporting up," Kirvan predicted. "Even CIO isn't an accepted title yet, so CNO has a long way to go."

But a handful of communications managers are far more upbeat. "There are a lot of things in the climate today that are allowing communications managers to really spread their wings," said Bill Rush, vice president of information systems at The Prudential Services Co. of America in Roseland, N.J. Not long ago, communications managers were paid to babysit the infrastructure—they made sure the network and the telephones functioned properly. But the role has changed significantly, Rush believes. "We still have to maintain the infrastructure," he said, "but what we really bring to the table now is what we can contribute to the business."

Rush handles voice and data com-

munications for Prudential and reports to a senior vice president—as does Rush's peer, the manager of the data center. (There is no CIO at Prudential; Rush's boss and another technology senior vice president report up to a corporate executive officer.) "It's a great time for people in communications," Rush said.

Sherman Murphy, assistant secretary and director of communications technology at the Hartford Insurance Co. in Hartford, Conn., agrees. Once upon a time, AT&T was the only carrier and IBM was the world of computing, he said. Now platforms are various (requiring more time to assess them), vendor leveraging is more important, tariff deals are even wilder than the press reports—and communications managers work directly with end users to meet business requirements. "There is no standard solution anymore," Murphy said. "Everything these days is custom-made."

Murphy, too, reports to a vice president, who in turn reports to the company's CIO, Jack Crawford. Like Speight and Packer, he doesn't quite fit the profile of the CNO. (Prudential's Rush looks like a CNO in the making.) The 24-karat chief networking officer, like the one true CIO, will be an integral member of the company's top executive team. The CNO will thoroughly understand the business and take a leadership role in utilizing the network to enhance the company's competitiveness. Maybe the naysayers were right to scoff at the whole notion of a CIO—oops, make that CNO.

But there is one last place to hunt—Wall Street. Here is an industry constituted by information, where networks are becoming as fundamental to the business as passenger jets are to the airline industry. "Wall Street, in general, has placed a greater focus on individual aspects of communications, such as global networks, [than other industries have]," said Jeff Marshall, a managing director of Bear Stearns Companies Inc., an investment banking firm in New York. "Here at Bear Stearns, communications is already strategic, but now it is becoming more significant to business appli-

cations. Business decisions are made now from both a communications and a business-application standpoint."

That has the ring of high-level, strategic responsibility. "We don't have a CIO here," Marshall said. "I'm a managing director, with responsibility for the communications in the company."

Big Foot!

Marshall oversees the Bear Stearns network, including data and voice services, and related transmission and administrative services for clearing and trading securities worldwide. His customers are both internal to Bear Stearns and external—the firm markets clearing and trading services to over 1,000 other firms. Marshall and his staff are also exploring new networking technologies, such as SONET, and act as technology consultants within the company. "We are a communications/information services company within Bear Stearns," he explained.

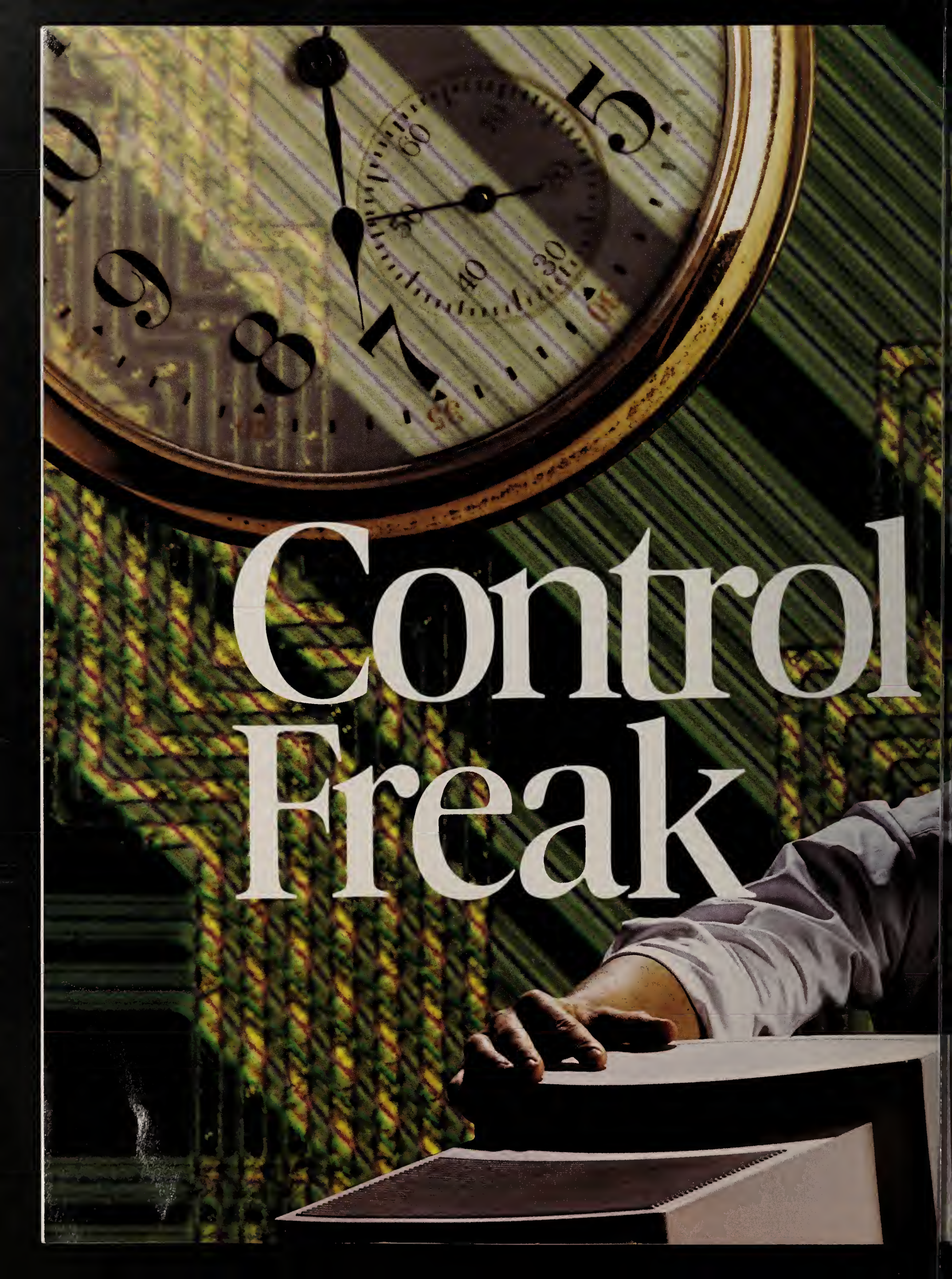
Marshall has been the firm's communications manager since 1986, following an eight-year stint in sales and marketing at MCI. "You can't be a technologist in this position, but you need to be [technologically astute]," he said. "You have to be a well-rounded individual with a hell of a lot of common sense." Marshall reports to the firm's CFO, as does his counterpart on the software and data side. The two technology managers have "the same amount of relative expenses," he said.

"In the future, the information flow to and from a business such as ours will be even higher-volume and more critical," Marshall predicted. "There will be newer ways to handle that information, such as ATM [asynchronous transfer mode—a high-speed switching technique]. Data will be handled in open architectures," not simply in mosaics of LANs and WANs. Interesting new technologies—such as those enabling wireless connectivity—will pose new opportunities and new challenges.

Perhaps by then, as consultant Kirvan suggested, a few networking managers might adopt the title of chief networking officer. "If [the title] can get someone an extra five or 10 grand a year, that's great." ☐

The 24-karat chief networking officer, like the one true CIO, will be an integral member of the company's top executive team. The CNO will thoroughly understand the business and take a leadership role in utilizing the network to enhance the company's competitiveness.

.....



Control Freak

*Or, How To Get More Control Over
The Out-Of-Control Via Remote Control.*

Adding or changing phone lines historically meant waiting for a technician to come to your office. But AT&T and your local telco have developed an approach that dramatically speeds things up. The AT&T BRT-2000 Access Node is a business remote terminal located in your building. It helps the phone company change your service right from the central office. Now when you call, additions or changes take minutes instead of days. Discover how a BRT-2000 can help your business get more control by remote control. Call your local phone company or AT&T Network Systems at 1 800 638-7978, ext. 5510.

*AT&T and Your Local Phone Company
Technologies For The Real World.*



AT&T
Network Systems

WORKING TO SCALE

There's nothing small about the problems faced by small-company CIOs, who must be flexible, creative and fearless—or risk losing the business

BY KATHLEEN MELYMUKA

In an economy looking for hope, small businesses provide a model of speed, efficiency and flexibility. Small businesses are so good at doing more with less that Wall Street is betting they will lead the way to economic recovery.

And in a rebounding economy, where new products and new styles of business carry the ball, small businesses (companies with less than \$100 million in revenues) are where inventors and innovators are found. "Small companies tend to be more nimble, more creative, less bound up in bureaucratic rigmarole," said Dick Jodka, senior portfolio manager at The Putnam Co. stock brokerage in Boston, who runs an emerging growth fund specializing in small companies.

The same can be said of the CIOs of small companies. They must be flexible enough to juggle many hats, creative enough to build responsive

DAVID WRIGHT: "You'd be surprised at what you can get with old technology."

DADDY'S JUNKY MUSIC

A Big Gamble

We're information junkies," said David Wright, COO at Daddy's Junky Music Stores. "We need our information, and we need it fast."

Daddy's, a \$15 million, privately owned, retail musical-instrument chain based in Salem, N.H., gets its information by means of an 80-terminal POS system run on a minicomputer, along with a PC/Mac network for administrative systems.

It was not always so. Wright developed the system when Daddy's was a \$5 million up-start running inventory by the seat of its pants. "David likened it to fitting a hand to a glove," said Fred Bramante Jr., Daddy's president. "I remember him saying we have to define what the hand looks like today and what it will look like tomorrow. After we really get all the dimensions of that hand, then we can shop for gloves."

Bramante took a big gamble with technology. "We put a tremendous amount of effort into [the system]," he recalled. "It almost put us out of business, frankly, but when we finally did get ahold of the thing, it enabled us to get control of the business."



systems on a shoestring, fearless enough to move forward without the ballast of bureaucracy and smart enough to move in the right direction.

The major difference between small- and large-company CIOs, according to Steve Fletcher, a consultant with Arthur D. Little in Cambridge, Mass., is that "in small companies, the head IT officer is often something else too, like the COO." Often the person with the most technical savvy ends up acting as CIO, regardless of official title.

At Daddy's Junky Music Stores, a \$15 million, privately owned, retail musical-instrument chain based in Salem, N.H., that person is David Wright. Hired as vice president of

Mark Klein is also the CIO. "My number-one job function [as CIO] is to do overall system design," he said. "My second function is to plan the implementation of that philosophy. I get involved in a third function in more of a managerial and supervisory way: I help select products we use."

Eventually, Klein plans to get out of the CIO business. "So far I've

"In a small company the CIO is closer to the details of the technology, but he also has a better opportunity to be part of the senior management group and participate in business decisions."

—Dave Siebert

AMERICAN COLLEGE TESTING

Focus on Flexibility

American College Testing (ACT) is a \$60 million, non-profit educational-service company, based in Iowa City, Iowa, engaged in the development and administration of educational-assessment and placement instruments. Dave Siebert is the company's CIO and vice president of the Information Systems Division, overseeing in-house applications including administrative and program support and major research programs. Many other programs, including all financials, are outsourced, giving ACT a flexibility more akin to much smaller companies. "We have not made major investments in technology," Siebert said. "One of the things that brought me here was a desire to get on the edge of the new tech rather than be on the edge of the old."

Siebert is bringing some of the outsourced programs back in, but in doing so, he is determined to remain flexible. "We deal in extremes of scale," he said, explaining that an exam program, for example, can grow by orders of magnitude virtually overnight. "You don't have the luxury of retooling, so systems have to be flexible enough to grow easily or port easily from one platform to another."

marketing in the early '80s, Wright immediately became the force for technology at Daddy's. "I've always been the CIO," he said. "From the start, information management was given a priority, and everyone was willing to put a considerable amount of muscle behind it in terms of investment and giving me the authority to get what I needed."

At Channel Computing of Newmarket, N.H., President and CEO

gotten out of marketing, sales, engineering," he said. "Operations blew up in my face so I'm still there, and [IS] is one of the things I still manage. I'll get out of it, but the company is not big enough for me to get out yet."

"In a company like ours, the president is the CIO by default," said Chuck Thomas, president and CEO of Apris Corp., a high-tech startup in Malvern, Pa. Thomas received some high-level support, however, when his chief technologist, hired predominantly for client technology, got Apris' own technology off to a running start.

"He set up a prototype of a client environment, which became our own environment," Thomas said. "In a general sense I make the [technology] decisions, but he makes them with me."



The basic one-year subscription rate for *CIO* magazine is \$94.

Subscribe And Save.

~~\$94~~* **\$59**

Yes, enter my one-year subscription to *CIO* magazine and bill me later for only \$59, a savings of over 50% off the cover price.

Name

Title

Company

Address

City State Zip

**This is a domestic rate only (Canada & US). The foreign rate is \$175 US.*

292

**PROCESS
IMMEDIATELY**



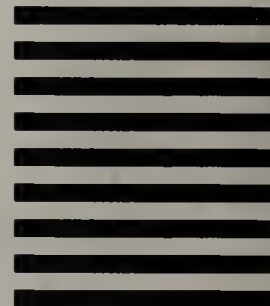
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1020 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

CIO Magazine
Attn: Circulation Department
P.O. Box 9208
Framingham, MA 01701-9900



Evaluating Global Networking Options

How to Find Your Way through the Complex Maze.





Get the Best Yo

Considering the complexities of the global networking environment, it's no wonder that the selection of a private data network is often a confusing maze of options where the only signposts are a bewildering litany of initials...VAN, PDNs, PTTs, SNI, SDLC, etc. Just where do you start in evaluating what you can get from your global network?

Price is, of course, an important factor. Yet VAN pricing structures are remarkably similar and price lists — by themselves — tell you little. The real need is to determine the “cost” in terms of your own resources to obtain the service you need, where you need it.

* “Evaluating Global Networking Options” has been developed as a service for those persons in organizations considering the selection of a global VAN. The term VAN, as used in this publication, has the meaning described in the section “VANs in the 1990s”.

GE Information Services
401 North Washington Street
Rockville, Maryland 20850

Copyright © 1991, by GE Information Services, USA

☐ Please send me more information about GE Information Services global networking capabilities.

I'm also interested in:
(check as many as apply)

- ☐ EDI
☐ Electronic messaging
☐ Network security
☐ Other _____



GE Information Services

Name _____

Title _____

Company _____

Address _____

City _____ State _____

Zip Code _____

Telephone Number _____

Place
Stamp
Here

GE Information Services
c/o Global Options (MC07E)
401 N. Washington Street
Rockville, Maryland 20850-1785



Can from Your Global VAN*

In the following pages, we'll help you look at the important aspects of VAN service, both in terms of how different vendors approach them and how best to map them against your requirements. The information is designed to assist you in asking the key questions when you evaluate a vendor:

- Where is the network accessible around the world?
- Where is local support available around the world?
- What protocols are supported?
- What security systems are in place to safeguard your data?
- Can you receive a single bill for the service regardless how many countries you have access in?

- What span of business applications and/or custom applications are available?
- What networking management systems are in place to give you the control required to keep costs within budget and your services flexible?

We believe that the following information — a distillation of GE Information Services' three decades of experience in global networking — will help you define your requirements with more precision and take the mystery out of selecting global networking options.





Business Goes Global — the Issues

In the 1990s, global competition and global business communications have become inseparable. In a shrinking world, it is essential for your business to enlarge its markets and to expand its sourcing further and further afield to maintain the scale and presence that keeps it competitive. It is equally essential to move business information—in electronic memos, purchase orders, invoices, financial transactions, and more—throughout your market as quickly, reliably, and cost effectively as technology permits.

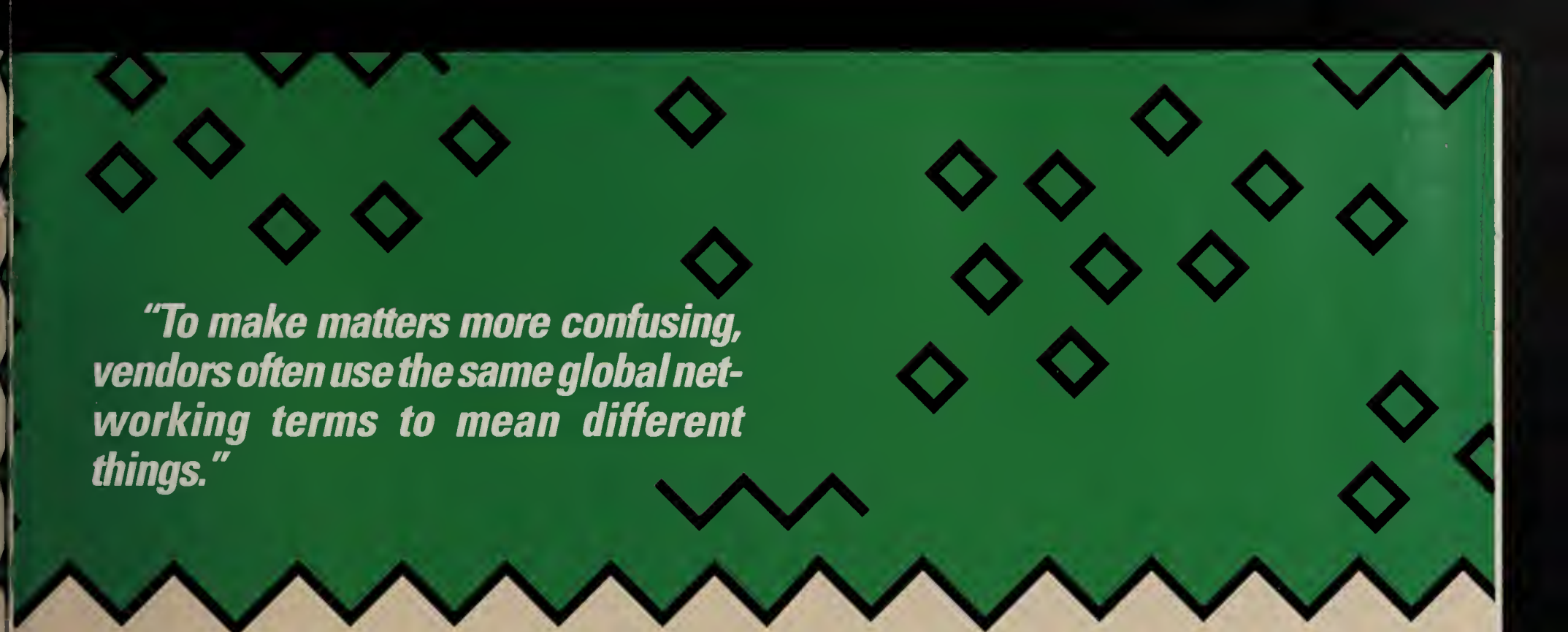
As the marketplace grows for most industries, the playing field is becoming more crowded. From Europe, a wealth of new global competitors is emerging as the European Community lowers its internal market barriers in 1992. Both geography and explosive expansion in the Pacific Rim demand and reward good communications. New contenders are constantly gearing up to make the leap from the national to the multinational arena.

The most expensive decision the global business can make regarding information management is when to build and manage private network links and when to use the services of a commercial network.

Texts on building networks abound. But getting a firm grasp of the alternatives offered by network service vendors can be elusive. Instead of texts, you must base decisions on what each vendor tells you about its service characteristics, its technology, its connection locations, its computing power, its performance quality, and its fit with your networking needs. And to make matters more confusing, vendors often use the same global networking terms to mean different things.



"The most expensive decision the global business can make regarding information management is when to build and manage private network links and when to use the services of a commercial network."



"To make matters more confusing, vendors often use the same global networking terms to mean different things."

Parties to the Global Networking Solution

VANs. PDNs. IRCs. PSTNs. PTTs. What precisely are their service realms? What parts do they play in the global information system? Understanding how each of these entities views its mission, and its relationship with other players, can clarify a lot of global communications issues.

Public Data Networks in Europe

The term "public data network" or PDN originated in Europe. Here, postal, telegraph, and telephone services have been provided as public utilities for many years. The national government agencies involved are commonly referred to as PTTs (though, of course, actual agency names differ widely—like Bundespost in West Germany). When data communications needs developed, PTTs built and operated PDNs as a logical counterpart to their public switched telephone networks (PSTNs).

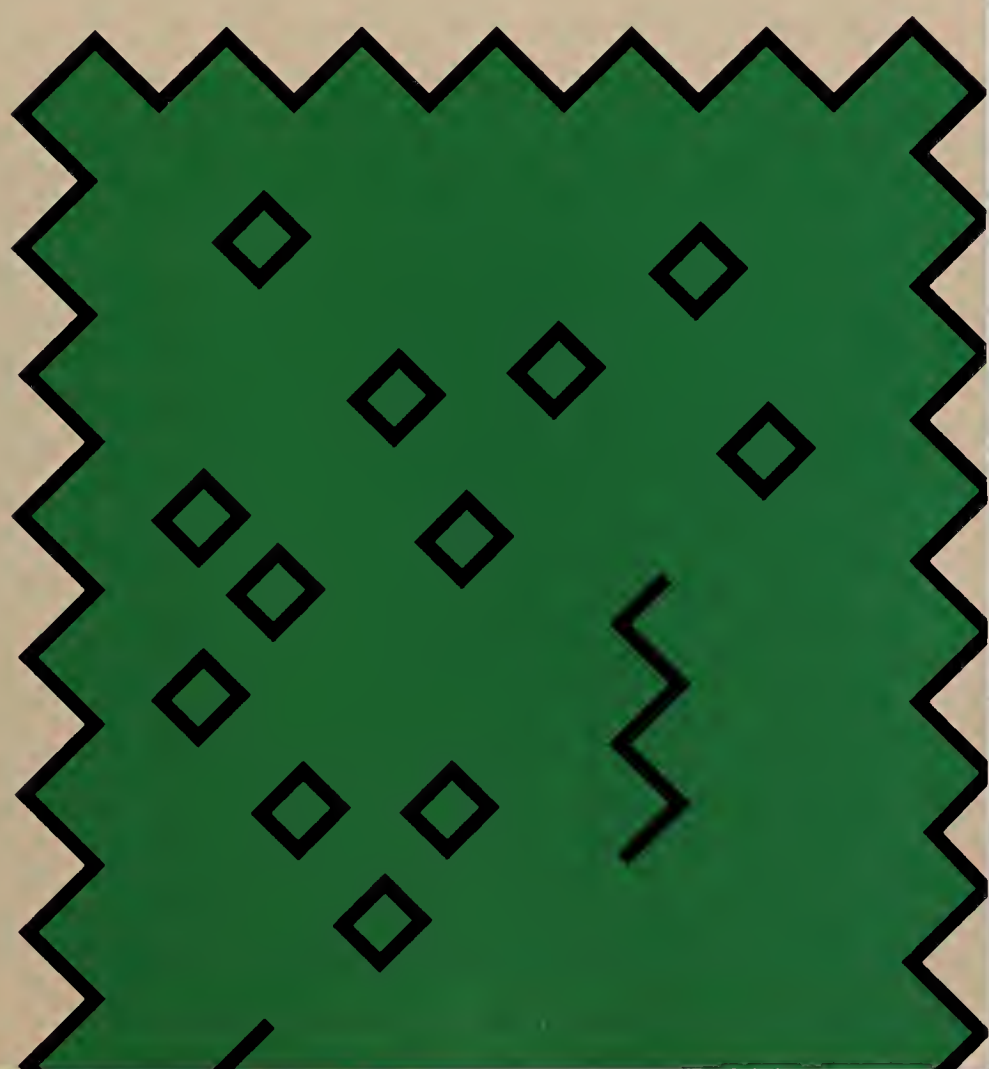
The PDN Heritage

Data communications services, like voice services, were introduced as government monopolies. To protect their revenue bases, PTTs placed tight restrictions on the use of the circuits that private and commercial networks leased to build

their own facilities. In most cases, simple resale of the circuits to third parties for "basic data transport" was prohibited.

In practice, this usually meant that a company's private network could serve only its own employees. A network operator could admit other users (customers, suppliers, partners, etc.) only if their destination was a value-added application involving "significant processing" on the operator's computers. No private or commercial operator could offer its network as just the transport medium to someone else's computers. That would infringe upon the PDN's basic data transport domain.

One had to know, however, how any given PTT viewed the concept of "significant processing." In the United Kingdom, for example, any network application that took the user's data through a central processing computer could qualify as significant processing. Yet in Switzerland, even commercial electronic mail applications didn't qualify since the sender's messages are delivered to the receiver unchanged. Where this type of definition was applied, E-mail customers





had to use the PDN to access their mailboxes, even when the E-mail company had a network available.

Today, governments are under pressure from equipment makers, service vendors, and the European Community's 1992 goals to adopt a more liberal attitude. More open competition is needed to boost pan-European service quality. Responses are varied, of course. Countries like the UK have done away with monopoly protections altogether. Others are working through various degrees of deregulation and reregulation. Separating the regulating agency from the operating agency is common, giving rise to new terms like Public Telecommunications Operators and Telecomms Administrations.

Public networks will continue to see their monopoly protections shrink. European businesses with global aspirations demand more choices in networking services. Nevertheless, the PTT heritage will shape the European service environment for years to come.

Diversity Reigns

Indeed, variations across Europe go beyond questions of service definitions. A private or commercial network builder may have to establish an in-country corporation as a prerequisite to deploying network components. Deployment schedules must take into account that leased circuit deliveries can range from 60 days in one country to more than two years in another. Network technology, standards, capacity, service capabilities, and repair response time can vary according to a given government's spending priorities and public policy objectives.

Equipment restrictions, too, can narrow a network planner's options. Because of their public service character, PDNs were often built with national hardware manufacturers in mind. As a result, many PTTs tend to favor domestic brands in their approved access device lists. West Germany with Siemens, Sweden with Ericsson, and France with Alcatel are good examples. While most PTTs are liberalizing their policies and broadening device support, biases tend to linger. In extreme cases, only modems supplied by the PTT may be used. Or users must select

modems from among a few brands that are accommodated by the PDN. Other PTTs permit the attachment of user-supplied devices after they have passed extensive certification testing, called "homologation." Delivering this certified equipment to users may then entangle the network planner in export/import regulations unique to each country.

The Border-Crossing Challenge

Cross-border network connections between PDNs also lack uniformity. While many PTTs operate top-quality national networks, the connections between PDNs often suffer from murky responsibility for quality, capacity, and financial support.

The European Association of Information Services (EUSIDIC), an end-user association based in the Netherlands, is among the many groups demanding that these problems be solved. The Association has audited trans-Europe service quality annually since 1986. Its 1990 study revealed that, while things are improving, trans-Europe data calls failed nearly 20% of the time. The group pounds home the point: "the Europe-wide chain is not working . . ."

As if these technical challenges were not enough, the global network operator must also be prepared to handle different languages, time zones, and business practices, and be sensitive to the social and political nuances of maintaining good relationships with numerous local service providers.

Network Services in the Asia-Pacific Region

Global businesses face even greater diversity amongst the countries rimming the Pacific. National telecomm environments here can match the complexities of Europe. But to them, one must add huge distances and a broader spectrum of commercial and technical maturity.



"Network technology, standards, capacity, service capabilities, and repair response time can vary according to a given government's spending priorities and public policy objectives."

"The scarcity of communications-trained people will keep maintenance and support among the top problem areas for network operators."

Service Begins with the PDN

Nearly every country in the region has basic PDN services. Many are government monopolies, but that's not universal. Among national telecommunications markets, New Zealand is probably the least regulated in the world, while Asia's developing countries are among the most restrictive.

Japan, of course, has a very complete networking infrastructure. Government-owned Nippon Telegraph and Telephone dominated the data communications market until it was deregulated in the mid-1980s. A host of commercial VAN services has arisen since, many of them associated with the country's hardware manufacturers. International connections with global VANs or international carriers are readily available to link the Japanese, European, and US markets.

National Strategies Drive Technology

Communications capabilities are central to the growth strategies of other Pacific Rim countries. Singapore's government has invested heavily in networking facilities and services to attract its target industries—manufacturing and financial services. Others have followed its lead in one way or another. Newly industrialized Taiwan and Korea, though less advanced, have the money and commercial incentive to catch up quickly.

Developing nations, where low-cost manufacturing will migrate in the 1990s, are struggling with limited networking facilities and investment capital. For the next few years, global businesses must be satisfied with lower service capacity and quality than may be had in places like Europe and the USA.

Change at a Blistering Pace

The Asia-Pacific is surely one of the fastest changing networking environments for the global business. Regional trade and manufacturing is ex-

panding aggressively. National markets are changing from export producers to consumer societies. Pressure for intra-Asia connections will soon rival the demand for more inter-continental links. The scarcity of communications-trained people will keep maintenance and support among the top problem areas for network operators. But the potential rewards of Pacific expansion—cost-effective manufacturing and growing new markets—may well prove critical to your global business.

Commercial Data Networks in the United States

In the USA, two factors combine to create a distinctly different networking environment—continent-wide telephone service and longstanding competition in the data networking service arena.

Weak Links in the Pan-European Electronic Information Chain

Probable Cause of Failure	% of Failures	Probable Fault	
		Telecomm	Other
Disconnected without asking	14.0	X	
Local node busy	13.4	X	
No response from local node	13.0	X	
Data network problem (congestion)	9.9	X	
Line noise (work impossible)	8.7	X	
No response when in local node	8.3	X	
Failure unclear	5.5	X	X
Error-Reset	2.0	X	
No connection to host	13.0	X	X
Host down or unavailable	7.7	X	X
User error	4.0		X

Source: EUSIDIC, Survey of Public Data Networks in Europe, 1990.



Ma Bell's Legacy

Before losing its monopoly over voice services, AT&T built the important legacy of a single, integrated, coast-to-coast voice network. True, US telephone customers must now contend with multiple vendors for local and long distance services. Yet the system retains a cohesiveness that cannot be matched by the diverse interconnections and divergent responsibilities inherent in the European and Asian environments. Businesses in America continue to expect their coast-to-coast calls to go through, their connections to be clear, and new leased circuits to be installed in 30 days or less.

Competitive Heritage

Data networks, most built for access to once expensive computing resources, developed outside of the voice network monopoly. Indeed, the Federal Communication Commission, in its 1980 Computer II Inquiry, ruled that

protocol conversion—the minimum capability for manipulating data traffic—was the added-value service that distinguished an “enhanced” [unregulated] service provider from a “basic” [regulated] voice service provider.

Global trouble arose, unfortunately, when Computer II equated its term “enhanced” with “value-added.” Industry observers coined the term value-added network or VAN for those US vendors offering only the minimum capability—protocol conversion. In Europe, by contrast, value-added seemed synonymous with “significant processing.” As US service vendors expanded internationally, misunderstandings prevailed about whether a US-based “VAN” operator was trying to sell data transport in countries where that was reserved to the PDN.

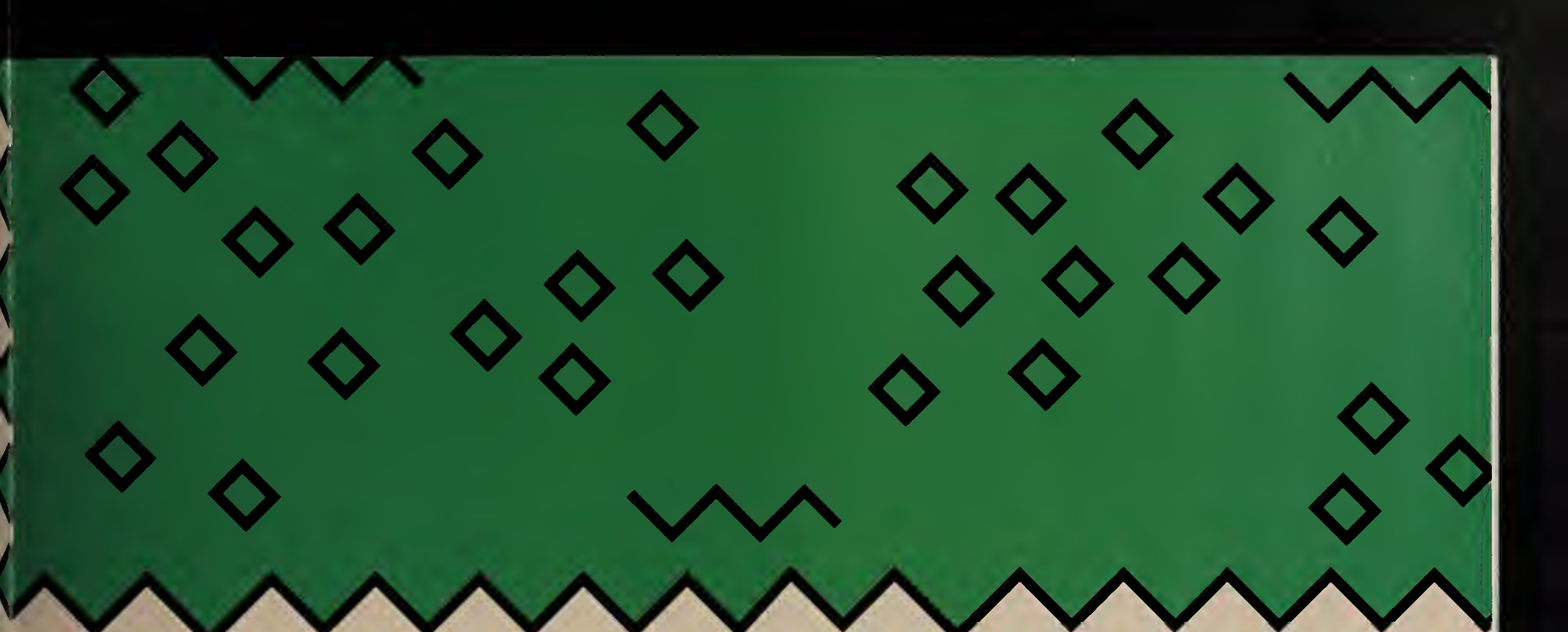
To add to the confusion, even more terms were invented—value-added services (VAS) and value-added data services (VADS)—in an effort to distinguish between the US, European, and Asian perspectives.

But times and terms are constantly changing. US-based network services, particularly the minimum-capability variety, have had to expand their offerings continually to remain successful. Today, most offer at least a few applications that can pass the “significant processing” test.

These services range from specialized database access and newswire clipping services to huge, complex applications such as global financial consolidation systems, manufacturer/supplier EDI systems, and systems specially designed for particular industries. The latter might be, for example, a nationwide retailer's system that collects product sales information at the cash register, implements price changes, and tracks sales trends and customer demographics.



“Competition also compels US networks to maintain sufficient capacity to accommodate new customers without delay and to maintain high availability levels throughout their extensive facilities.”



Competition also compels US networks to maintain sufficient capacity to accommodate new customers without delay and to maintain high availability levels throughout their extensive facilities. Network technology and management systems must be continually upgraded. US services know that, if they do not invest in new capabilities, more robust network management tools, and ever more efficient and versatile internal network components, their customers can and will switch to those vendors that do.

As a result, American businesses today are accustomed to shopping around for diverse protocol support, quick service implementation, state-of-the-art technology, and specialized teleprocessing and messaging applications from their network service providers. When these same businesses embark upon global networking, some are caught off guard by the daunting tangle of bureaucracies, regulations, and restrictions outside US borders.

VANs in the 1990s

Evolving changes in the marketplace continue to confuse the issue of what it means to be a VAN. Because US networks have been driven to broaden their services, the term VAN has lost its narrow "protocol conversion only" focus in the US. For industry observers like DataPro Research Corporation and International Data Corporation, a company is a VAN if it provides, via its network and processing centers, a combination of value-added services such as:

- electronic mail
- electronic data interchange (EDI)
- proprietary and third party database access
- managed data network services
- custom and/or industry-specific application systems

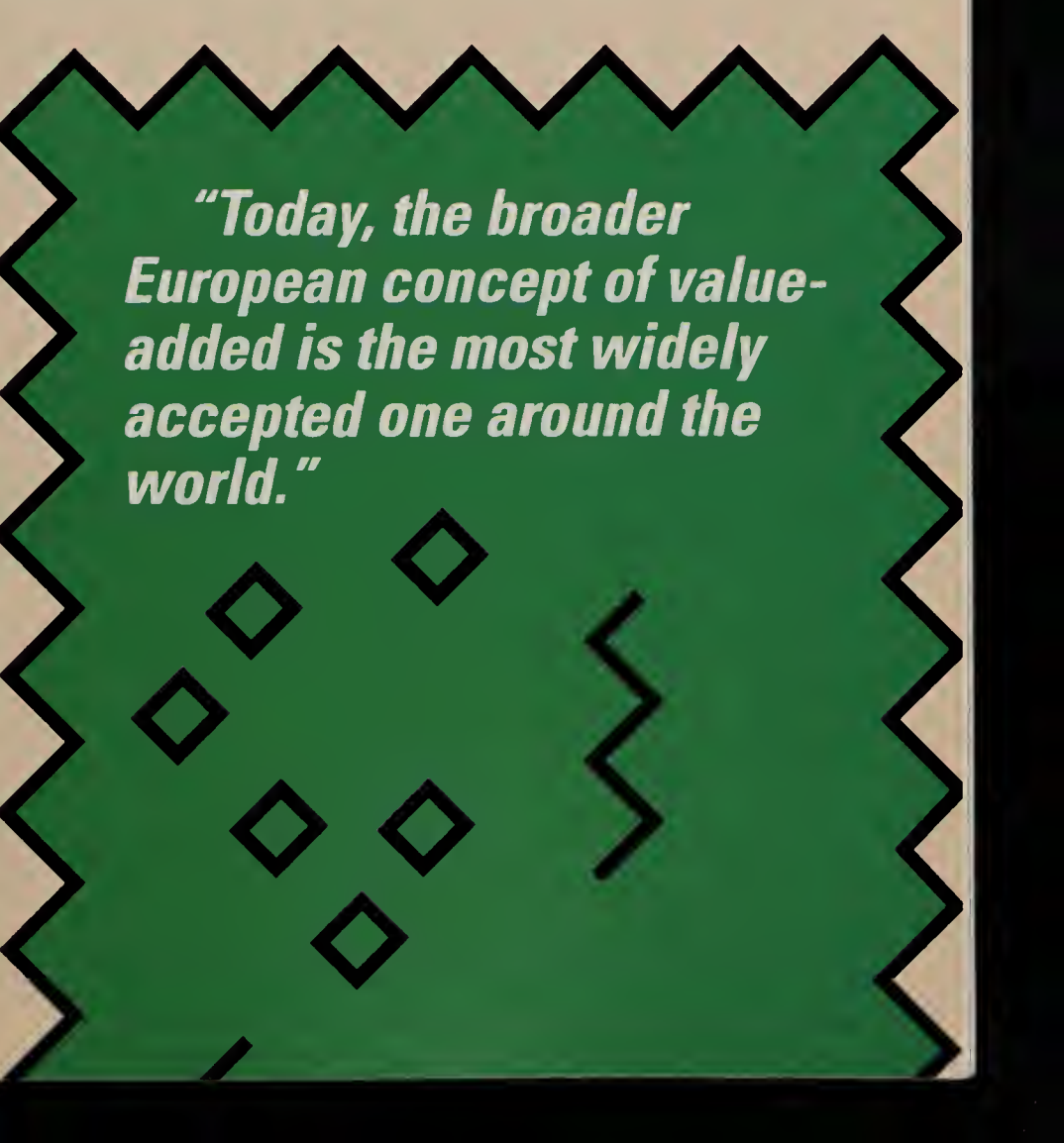
Some US VANs, stirring the alphabet soup further, have taken to calling themselves "public data networks" to emphasize their open user access features. At the same time, deregulation has freed former PDNs like British Telecom's PSS and Australia's Telecom to launch a growing range of "value-added" services.

Today, the broader European concept of value-added is the most widely accepted one around the world. It's the

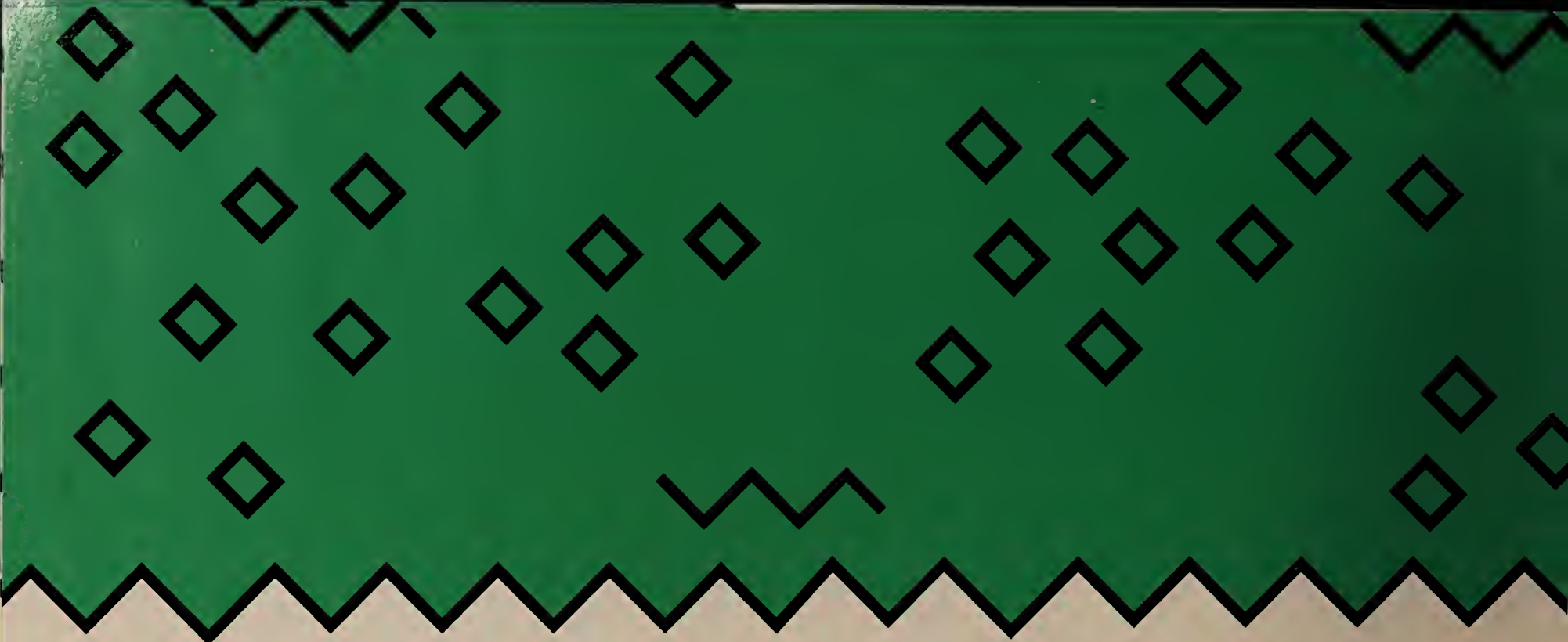
way we use the term VAN in this publication. The networking options we'll cover are generally those available from the kinds of vendors that can provide you with a full range of network-based applications. Keep in mind, however, that no one vendor actually offers all possible services, in all possible markets around the world.

The Global Players

Not all US VANs have added global reach to their repertoire. Those that do have international coverage face an additional set of market requirements. Network nodes must be established in as many countries as their customers wish to do business. Support staff must be provided in those countries as well. Where in-country nodes are not cost-effective, or where they are prohibited by PTT regulation, these vendors must develop strong relationships with local PDN operators and equipment providers, as well as with inter-connecting international carriers, to ensure that their local users get the best service available.



"Today, the broader European concept of value-added is the most widely accepted one around the world."



Generally speaking, those VANs with the longest experience in managing and operating global networks will have the best supported service in the greatest number of countries. They have had the time and resources to work through the complexities of building global connections and cementing relationships with local authorities.

International Carriers

International carriers are in the business of providing voice and data network connections between two countries. US-based carriers, called International Record Carriers or IRCs, are licensed by the Federal Communications Commission to connect American networks to others around the world. A number of European countries operate international carrier services between PDNs in Europe, Asia, and beyond.

International carriers maintain land and undersea cables—fiber-optic or copper wire—and satellites to provide network interconnections. Public and private networks contract with them to provide specified capacity for their voice or data traffic between countries. International carriers provide transport service only, on a regulated basis. Some do, however, have deregulated value-added service arms.

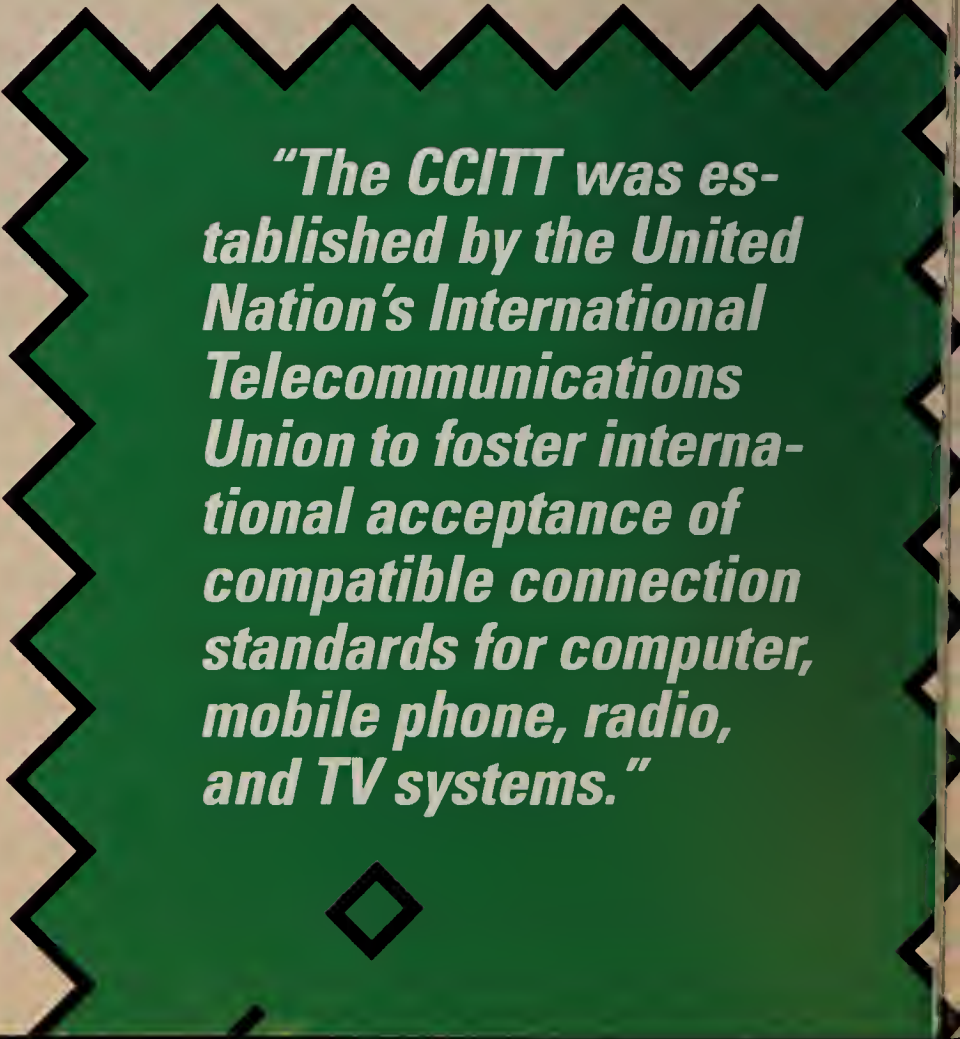
International Communications Standards

X.25. X.75. V.22. What's the latest status of these international standards? And how should they affect your global networking decisions?

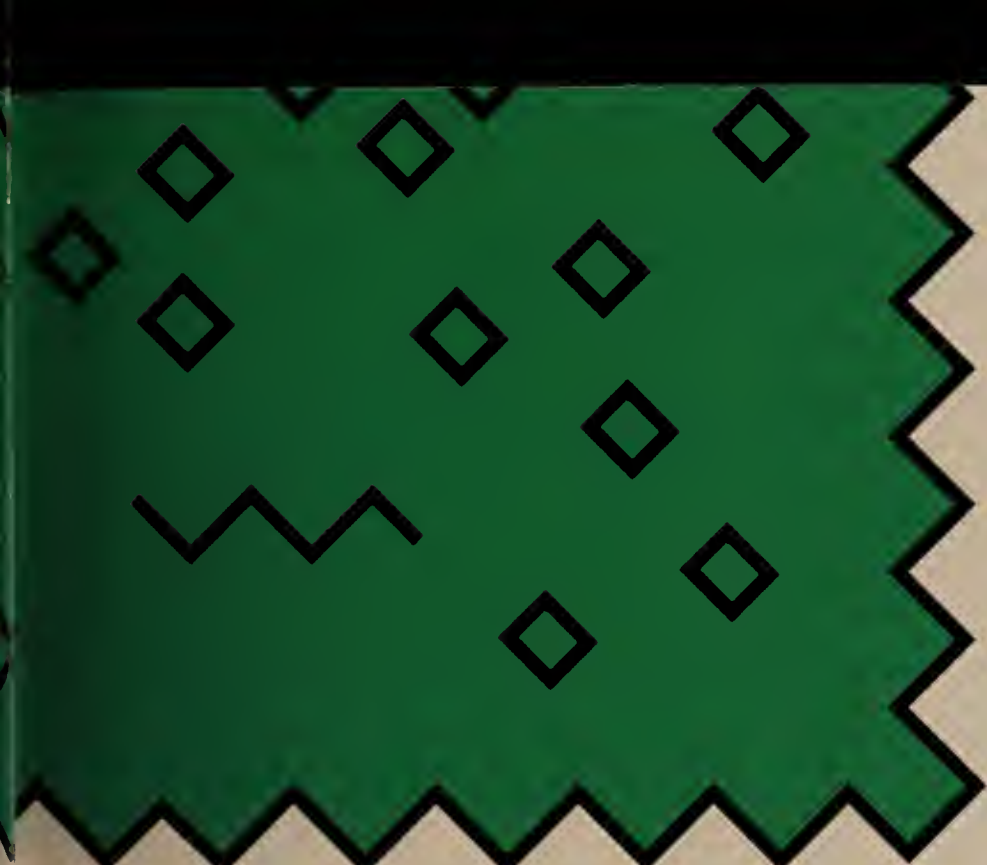
In the late 1960s and early 1970s, different networking technologies were developed independently by individual service providers. Communications *among* networks was not originally envisioned. As a result, optimal use of communications facilities was hampered by the inability or unwillingness of the hardware industry to accommodate so many mutually exclusive communications techniques or protocols.

The most prominent organization to address this problem is the Consultative Committee for International Telegraphy and Telephony. The CCITT was established by the United Nations' International Telecommunications Union to foster international acceptance of compatible connection standards for computer, mobile phone, radio, and TV systems.

The CCITT holds plenary sessions every four years to "recommend" new or refined ways to resolve differences in the way communications devices operate. The group has no enforcement powers, but its Recommendations enjoy the force of international technical consensus. Because the



"The CCITT was established by the United Nation's International Telecommunications Union to foster international acceptance of compatible connection standards for computer, mobile phone, radio, and TV systems."



issues they address are extremely complex, a Recommendation may evolve over several years before it is sufficiently robust to enable hardware manufacturers and networks to begin actual implementation.

Network Interface Standards—The X Series

Recommendations in the X Series illustrate the CCITT's work. X.1 through X.29 describe the behavior of data communications networks, their services and facilities, and their means of interfacing with terminal equipment. Recommendation X.25, for example, concerns the interface between a packet network and an X.25 packet-mode terminal. The core of the X.25 protocol resides in the 1976 and 1980 Recommendations. 1984 and 1988 saw publication of mostly refinements and options.

It's important to keep in mind that about two-thirds of a given Recommendation may consist of optional features. So the capabilities you get will still vary from one X.25-compliant network to the next. Remember, too, that X.25 is an external interface protocol. Some networks offer additional interface protocols to provide enhanced performance for particular terminal types, like IBM 3270s. And while some network's *internal* switches communicate in X.25 mode, others employ proprietary internal protocols that make specialized services possible.

The evolutionary nature of international standards is further evidenced in the more recent development of the X.75 Recommendation on network-to-network interfaces. X.75 is not in competition with the X.25 interface. It's a companion protocol describing features unique to internetworking environments.

In particular, X.75 provides the ability to track a user's data stream step-by-step through consecutive networks. This activity, employing X.121 multinetwork addressing, is invisible to your users. But you can expect improved usage tracking and reporting, and more flexible billing, from an X.75-compliant network.

Modem Standards—Bell and the V Series

The first modem protocols were developed by AT&T's Bell Laboratories, and are the dominant low-speed stan-

dards in the US. Bell 103 supports data transmission at 300 b/s, and Bell 212A operates at 1200 b/s.

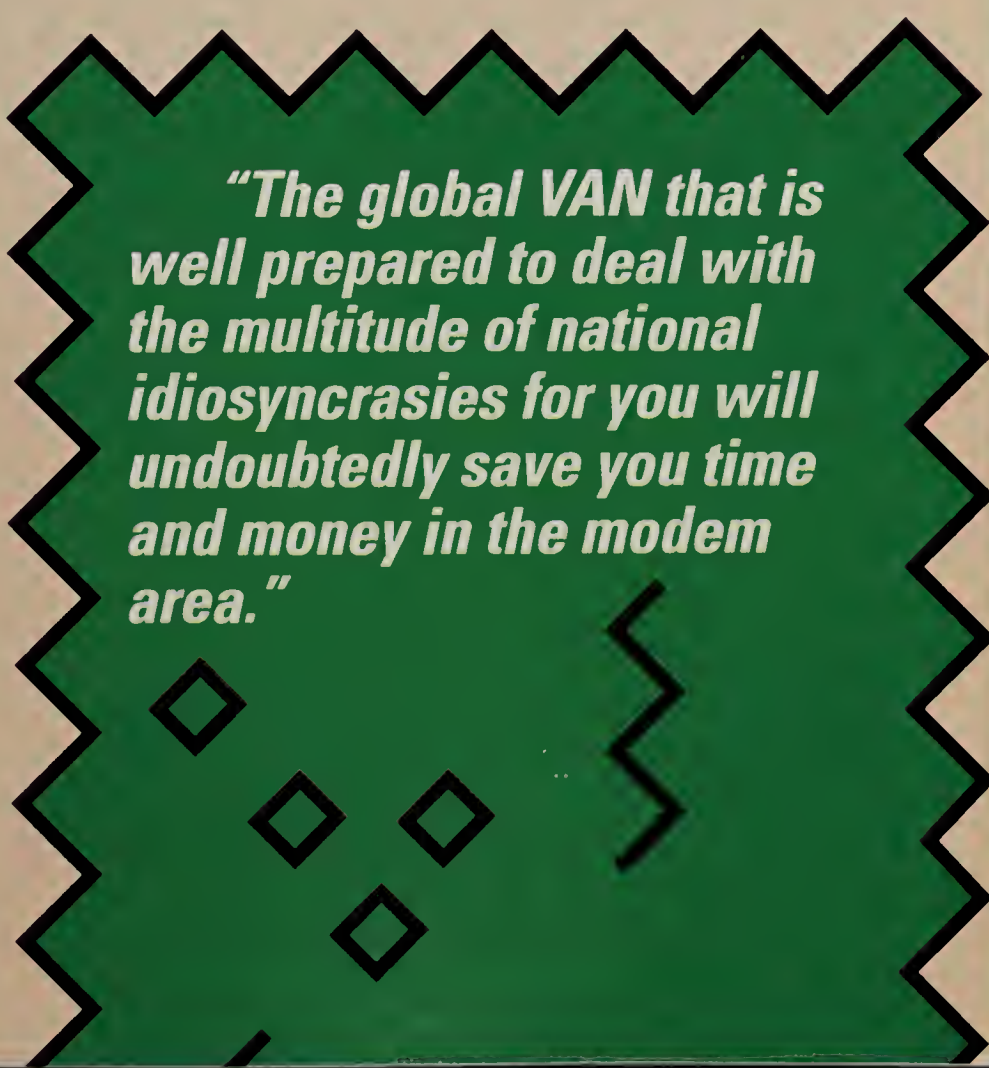
The more recent CCITT standards, called the V Series, are dominant in Europe and elsewhere around the world. V.21 supports 300 b/s, and V.22 supports 1200 b/s.

At these speeds, the two standards are not interchangeable—Bell 212A and V.22 are only about 60% compatible, and Bell 103 is 100% *in*-compatible with V.21.

For higher speeds, the V Series rules. For 2400 b/s transmission, both Bell and CCITT modems comply with V.22 bis. For 9600, the standard is V.32. Don't forget the rule of thumb about optional features. A V.22 modem designed to work on France's TRANSPAC will not necessarily work on Canada's DATAPAC.

The modems you supply to your users may be the most important piece of hardware in your global information system. They can be the basis of smooth operations or the cause of constant irritation. PDN staff can give you good advice about the ins and outs of modem deployment in their own country. But you should expect more from your VAN service. The global VAN that is well prepared to deal with the multitude of national idiosyncrasies for you will undoubtedly save you time and money in the modem area.

GE Information Services has prepared this hand book to shed some light on the nuances surrounding network alternatives. If you plan to install private connections in another country, as we often have done, perhaps this book can spare you some surprises. When you are comparing network service vendors, our suggestions may sharpen your ability to make the choice that best serves your unique requirements.



"The global VAN that is well prepared to deal with the multitude of national idiosyncrasies for you will undoubtedly save you time and money in the modem area."

GE Information Services

GE Information Services, a division of General Electric Company, USA, is headquartered in Rockville, Maryland. GE Information Services offers a full portfolio of value-added services such as electronic data interchange, business communications, and network management services. Comprehensive training and implementation assistance are an integral part of GE Information Services' offering to provide prompt, effective system start-up, as well as 24-hour worldwide technical support in the local language for quick problem resolution.

1-800-433-3683



USA

GE Information Services



The basic one-year subscription rate for CIO magazine is \$94.

Subscribe And Save.

~~\$94~~* **\$59**

Yes, enter my one-year subscription to CIO magazine and bill me later for only \$59, a savings of over 50% off the cover price.

Name

Title

Company

Address

City State Zip

*This is a domestic rate only (Canada & US). The foreign rate is \$175 US.

**PROCESS
IMMEDIATELY**



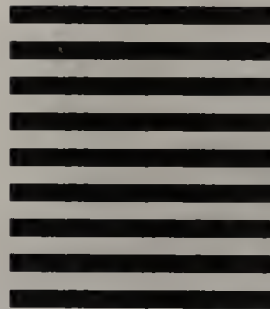
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1020 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

CIO Magazine
Attn: Circulation Department
P.O. Box 9208
Framingham, MA 01701-9900





STEVE MILSTON: "In multibillion-dollar companies, users hate IS, whereas our users view us very positively."

Regardless of who makes the decisions, the key to success for the small-business CIO is the same as for the CIO of a multibillion-dollar corporation, according to ADL's Fletcher. "Successful CIOs are the guys that keep the business perspective," he said.

CIOs of small companies agree that that's easier to do in their environment. "In a small company the CIO is closer to the details of the technology, but he also has a better opportunity to be part of the senior management group and participate in business decisions," said Dave Siebert, CIO and vice president of the Information Systems Division at American College Testing of Iowa City, Iowa, a \$60 million, non-profit educational-service company engaged in the development and administration of educational-assessment and placement instruments. "It's easier to understand the business issues because there's not as broad a scope as in a billion-dollar company. The CIO doesn't have to see as far, because the fences are not as far away."

It's easier still for executives who moonlight as CIOs. "If you want to make IT go in the same direction as the business, it's a lot easier when

the same guy is running both," Fletcher said.

Another characteristic of small companies is the need to keep a tight rein on spending, according to Andy Bronstein, director of the high technology group at Coopers & Lybrand in Philadelphia. "From the standpoint of resources, smaller companies are more limited," he said.

Those limitations "force us to be more strategic in our thinking before we suggest an expenditure," said Steve Milston, CIO and vice president of information services at Health Risk Management Inc., a \$20 million public company in Minneapolis that helps large, self-insured employers manage the risk of underwriting their own health care. "Rather than always buying new from vendors, we often find we can deliver higher quality with less-expensive iron."

"We're more selective," Milston explained. "But because we're much closer to things, we have a better understanding of what's needed, so it's much easier to cost justify."

"Obviously, the system I want [ideally] is not what I have," said Daddy's Wright, whose POS system is getting on in years, "but you'd be surprised at what you can get with

HEALTH RISK MANAGEMENT

Usable Issues

At Health Risk Management (HRM) Inc., a \$20 million public company in Minneapolis that helps large, self-insured employers manage the risk of underwriting their own health care, proprietary technology called Autopilot guides individual cases online through a review of diagnosis and treatment plan, price control and claim payment.

With a mainframe, centralized approach for corporate information and PCs for individual and departmental requirements, HRM is looking into cooperative processing. "We're trying to maximize our investment," said CIO and Vice President of Information Services Steve Milston.

Milston is also looking at expert systems, artificial intelligence and voice technology for the telephone-intensive operation, always attempting to separate "usable issues from shiny new toys."

"Large companies have to overcome inertia—both economic and methodological. They have to be driven by a very specific motivation. Smaller companies will make a change because they tend to be at the leading edge."

—Chuck Thomas

old technology if you have an information culture."

Small-company CIOs must also be more concerned with cost-effectiveness than their larger counterparts; those with fewer bucks to spend have to get more bang for them. "We're concerned with running the business as efficiently and effectively as possible," said Jim Tuominen, assistant vice president for information systems at the National Fire Protection Association of Quincy, Mass., a \$40 million non-profit membership organization dedicated to fire safety. "We're focused on basic business processes, not expert systems or strategic information systems. We do a lot of basic blocking and tackling from a business standpoint."

Tuominen's goal is improved business processes, and he always looks to the most efficient means to that end. "Others may tend to throw hardware and software at problems," he said. "We tend to look at and question current processes."

Asking hard questions gets the creative dialogue going, said Tuomi-

nen. "From there we can decide whether we just need to tune the process or involve information technology."

But the small-business environment that necessitates thrift also enables flexibility. And flexibility gets results. Jay Nathanson, vice president and de facto CIO at Target Marketing in Richmond, Va., tells of a larger competitor who lost a potential client because it couldn't change its method of invoicing. "We got the job because I was able to make a small change in our format," he said. "[They] couldn't do that."

In addition to flexibility, lack of bureaucracy gives small-company CIOs a distinct speed advantage over the big guys. Milston said the speed and responsiveness of his small IS department leaves larger organizations in the dust. When he worked at a much larger company, he said, "we had a staff close to 1,000 in technology. My staff is about 30, and by and large it's more responsive to the needs of the company."

"In multibillion-dollar companies, users hate IS, [whereas] our users view us very positively," Milston said. "There aren't multiple review boards between what a user wants and what's delivered."

Tuominen said that in his experience, large companies "tend to run large, monolithic systems that are difficult to change and inflexible. In a smaller company you're more effective in being able to accomplish change because the applications are smaller and the people are working together."

Thomas, who was manager of technical services at CIGNA Corp. before leaving to form his own company (Apris is his second startup) agrees. "Large companies have to overcome inertia—both economic and methodological," he said. "They have to be driven by a very specific motivation. Smaller companies will make a change because they tend to be at the leading edge."

But the ability to move quickly can be a double-edged sword. "Big companies have lots and lots of lay-



CHUCK THOMAS: "In a company like ours, the president is CIO by default."



JIM TUOMINEN: "We do a lot of basic blocking and tackling from a business standpoint."

ers and professional IT types to pass all kinds of blessings on decisions," said Fletcher. "Often the CIO in a small company is on his own."

And the decision that CIO makes may be wrong. "I think a small company has less room for missteps," said Klein. "You can't screw up. If you're big you can go off in one direction, and if it doesn't work you can scrap it. If you're small you have to make sure you do it right."

For example, small-company CIOs may get in trouble by pursuing a misguided quest for the state of the

art, Fletcher said. The same thing happens in big companies, but it takes longer and the results tend to be less drastic and the fault less easily assigned.

In a small company, all the positives can turn negative when things go wrong. "The speed is different, and the risk is not just losing a lot of money. In a small business, a bad decision can cost you the company."

[CIO]

Kathleen Melymuka is a freelance writer based in Duxbury, Mass.

NATIONAL FIRE PROTECTION ASSOCIATION

Grass-Roots Computing

Jim Tuominen, assistant vice president for information systems at the National Fire Protection Association in Quincy, Mass., is responsible for end-user computing, mainframe application support and technical services, but he seems most proud of the recent evolution of grass-roots computing at NFPA.

"I like to plant seeds," he said. The seeds in this case were Macs for office automation and personal-productivity applications. "Now we're leveraging our investment with shared applications and shared databases," Tuominen said. "As we re-engineer our processes, we're able to more effectively assimilate applications because people are not afraid of computers."

Currently, Tuominen is working on a cross-functional pilot project, replacing separate information sources with a shared database. "The pilot is breaking down barriers between organizations and establishing trust," he said.

Technology Investment A Big Name For A Big

G l o b a l P e r s p e c t i v e

Technology Investment Strategies Corporation helps corporate executives around the world make their strategic business decisions about information technology. Being a subsidiary of International Data Group has its advantages—specifically, access to 4,000 employees in 49 countries focused on the information industry.

R e s e a r c h A n d C o n s u l t i n g

- Technology Investment Strategies Corporation
- International Data Corporation
- IDC Financial Services Corporation
- Information Strategies Group
- Link Resources
- 34 International Research Companies

C o n f e r e n c e s

- World Expo Corporation

Communication Networks, Network Computing Forum, CD-ROM Expo, MACWORLD Expo, Berlin Unix Forum, Sun World Expo, and other events in 14 countries.

D a t a b a s e

160,000 computer sites worldwide
5,000 U.S. value-added resellers
Two million computer executives worldwide

T r a i n i n g

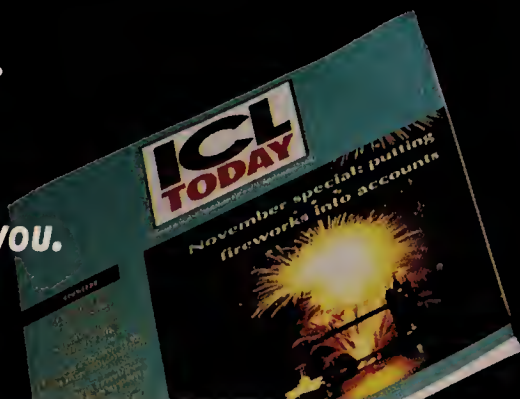
- ExecuTrain

Training over 150,000 individuals each year
More than 100 courses on the most popular software

B o o k s

- IDG Books Worldwide, Inc.

*Our analysts are expert at
exploiting this network for you.*



A World of Information



Technology Investment
Strategies Corporation
AN IDG COMPANY
1-800-726-TISC

Strategies Corporation— Company.

Information on Information Technology

These are among the 150
publications with 25 million
readers worldwide.

THE HIGH PRICE OF NICE

When its ambitious and highly user-friendly EDI recruitment program faltered, Sears learned that recalcitrant trading partners respond more readily to a hard line than the soft sell

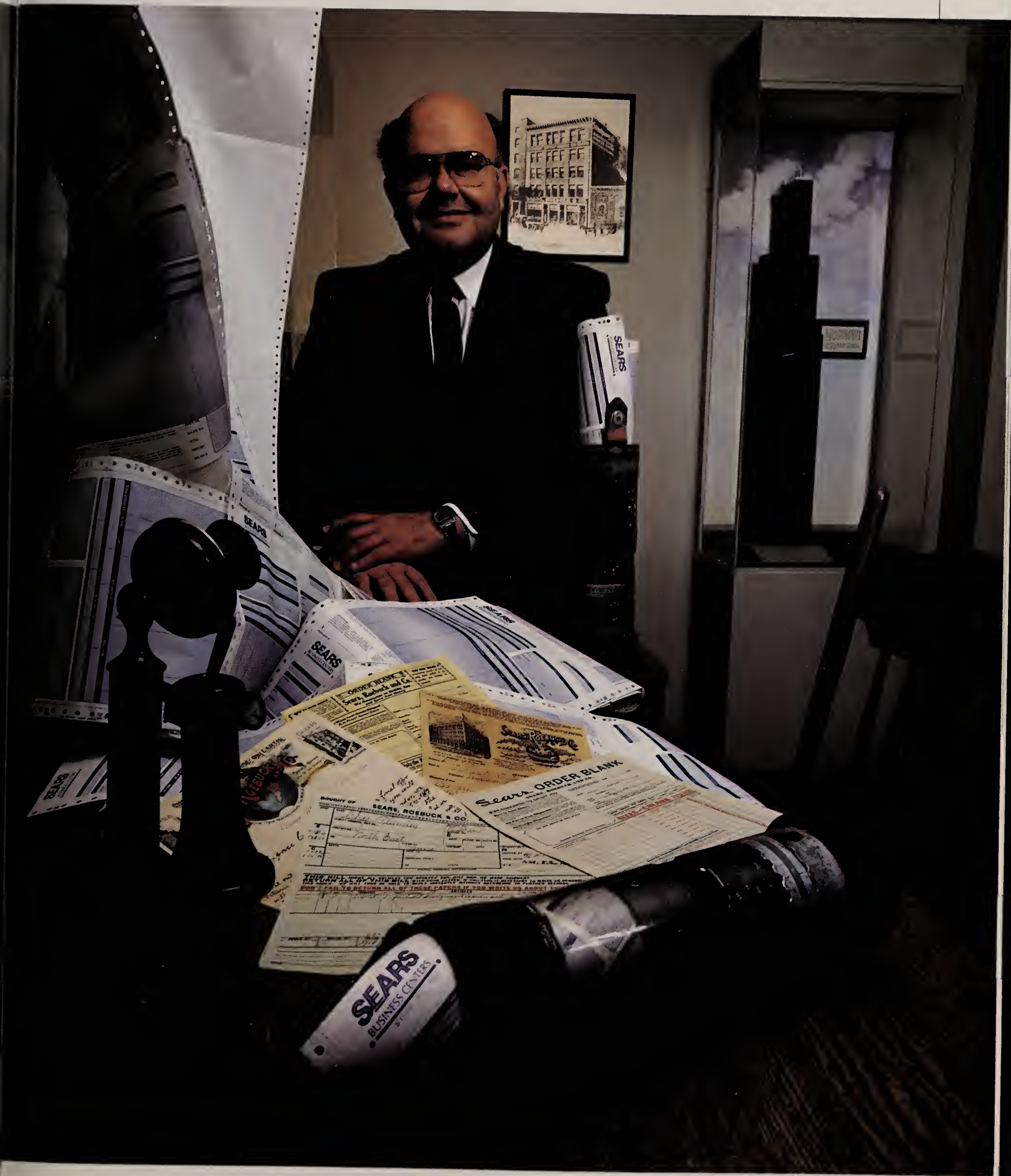
BY RICHARD PASTORE

WHEN IT COMES TO large-scale EDI implementation, nice guys finish last—or at least behind schedule. Over the past three years, the Merchandising Group of Sears Roebuck & Co. has learned this and a few other hard lessons about converting trading partners to electronic data interchange. Like its fellow would-be EDI hubs, Sears has confronted entrenched op-

position to change and pervasive EDI ignorance from its suppliers. As the conversion period drags on, internal costs mount and EDI benefits go unrealized, Sears is being forced to reevaluate some of its methods and goals.

Originally, Lance Dailey championed the nice-guy approach to EDI conversion. “I thought if I said, ‘Look, here’s how important EDI is to us, and here’s what we

LANCE DAILEY was disappointed that Sears had managed to convince fewer than half of its suppliers to adopt EDI by last fall, even after getting tough with implementation deadlines.



can do to support you,' I'd have people pounding on my door," said Dailey, Sears Merchandising's director of EDI implementation.

It didn't happen that way.

Even after getting tough with implementation deadlines in late 1990, the Chicago-based retailer had managed to convince fewer than half of its suppliers to adopt EDI by fall of last year. "If I look back to '89, I would have expected to be farther along than where I am," Dailey admitted.

*"I thought if I said,
'Look, here's how
important EDI is to us,
and here's what we can
do to support you,' I'd
have people pounding
on my door."*

—Lance Dailey

The disappointment is keener because Dailey has gone out on a financial limb to make EDI attractive to trading partners. According to Steve Johnson, managing partner of Andersen Consulting's Retail Industry practice in Chicago, "Sears has taken a uniquely constructive approach to facilitate its suppliers' adoption of EDI. It's going well past halfway toward meeting them." Andersen helped develop training and documentation for basic EDI translation software that Sears provides free to inter-

EDI's Paper Tigers

Without the ability to integrate EDI transaction data into other corporate systems, trading partners end up with a kludge instead of a competitive edge

What's wrong with this picture? Widgets 'R' Us receives an electronic purchase order from a retail partner; a clerk prints



CHANGING TIMES: Sears' retail stores revolutionized its catalog business; 70 years later, Sears and other companies are having trouble revolutionizing their suppliers' kludgy EDI systems.

a hard copy from a personal computer and rekeys the order into a minicomputer-based purchase-order system. Then the clerk turns back to the PC and types off an acknowledgment for transmission back to the retailer.

The widget supplier is engaging in "paper-based EDI," an oxymoronic and all-too-common practice, according to David Taylor, vice president of interenterprise systems at the Gartner Group consultancy, in Stamford, Conn. When EDI data is isolated from existing applications, the concept is reduced to the level of facsimile machines. Worse, users rob themselves and their partners of EDI's best benefits.

"We're saving on paper and postage, but we're not getting completely error-free data," because EDI partners continue to rekey information, said Dan Browning, director of EDI at Baxter Healthcare in Deerfield, Ill., and chairman of the Greater Chicago EDI Forum. "We also miss the benefit of faster turnaround."

To achieve basic EDI data integration, users typically write a program that converts EDI data to an ASCII flat file capable of being accessed by a host-based system. Paula Olson, CIO of sewing-machine-cabinet maker Arrow Products Inc. in Lake Geneva, Wis., used custom programming to convert EDI data to ASCII and import it to her ex-

isting applications. "I have all the information I need to handle 2,000 orders a day without having to rekey anything," Olson said.

Integration can be a daunting process for many firms. "Depending on how old the system is, it could be difficult to rewrite applications because they were never designed for that kind of input," said Tom Douglas, Sears Technology Services' director of EDI planning and customer support.

Many EDI translation software packages include mapping utilities to aid the integration effort. EDI software vendor American Custom Software, of Cookeville, Tenn., offers built-in tools that prepare EDI data for batch access by existing systems. But such utilities typically require custom programming to reconcile EDI data formats units with the differing formats used by applications. This can pose a problem for small companies that lack programming skills.

Fortunately, PC-based software is emerging that virtually eliminates the need for custom coding. Such packages—including ones from Paperfree Systems Inc., of Washington, and Integral, of Walnut Creek, Calif.—reconcile EDI units by means of relatively simple lookup tables. When such software becomes widely available, it may even be possible to stamp out "paper-based EDI."

—R. Pastore

The race goes to the best



In a highly competitive market, when everyone sails the same class boat, the winner of the race will be determined by the crew with the most experience, the ability to utilize the technology and the skill to react to shifts in the wind.

If your company is competing in the 1990s, BMC Software has the systems software products to give your information processing crew the critical edge to win the race.

Experience to win

BMC has more than a decade of experience in developing products for IBM's flagships of DB2, IMS, CICS and VTAM. We provide the superior products our customers must have to

compete 24 hours a day.

BMC's products offer the integrity, performance, and cost benefits to exploit the broad reach and go all out for speed in the race.

Tactical technology

By returning a record amount of revenues to research, development and support each year, BMC is able to concentrate on developing products that provide synergy across product families, are deep in function and contain original technology.

BMC's technical expertise allows you the tactical ability to point high into the wind for the best position when rounding the next mark of the race.

When the wind shifts

An experienced crew sees the ripple in the water showing a wind shift ahead and takes advantage of the lift to maintain the lead.

The industry is now shifting to 24-hour, cross-system accessibility and availability of all data. Only BMC has the experience and technology to give your crew the products that are needed to hold the lead in the race.

To ensure BMC is a part of your crew, call 713 240-8800 or **1 800 841-2031**.

BMC

SOFTWARE

The Experience. The Technology. The Future.

BMC Software international offices are located in Australia, Canada, Denmark, France, Germany, Italy, Japan, Spain and the United Kingdom
IBM and DB2 are registered trademarks of International Business Machines Corp. ©1992, BMC Software, Inc. All rights reserved





ested partners. Sears also picks up half the tuition tab for partners attending the company's EDI seminars—two-day introductory classes that have been roundly praised by attendees.

In late 1990, however, faced with slower-than-expected conversions, Dailey decreed EDI to be an official requirement for doing business with the Merchandising Group (while continuing to offer software and seminar support). He also began designating conversion deadlines for selected suppliers. Now Dailey has set a new across-the-board deadline: All "significant" vendors are expected to adopt EDI by the end of 1992.

"We could no longer sit back and wait for a voluntary program to work," Dailey explained. The benefits of wide-scale EDI implementation became too important to the bottom line to be deferred indefinitely. EDI has already improved customer service and generated invoice-processing efficiencies (see related item, Page 63). But similar efficiencies have not yet graced the distribution process. Nor has Sears been able to fully exploit EDI in inventory management. "Those [benefits] will come as we get a greater percentage of people onto EDI," Dailey said.

Part of the problem has been the necessity of pitching EDI to the wrong

RICHARD SIEGEL:

"Sears' mandate forced us to do EDI, to realize it's the way to go in the future. Otherwise we would have put it off."

Sprint has
two good reasons
for bringing its
Frame Relay to
market so fast.

One, you need it.
Two, it'll drive AT&T nuts.

By now you probably know all the benefits of Frame Relay by heart. All you've been waiting for is someone to make it a reality. Well, now your waiting is over. Because Sprint® is the first major carrier to bring Frame Relay to market.

Why did we do it so fast? For starters, we knew Frame Relay's bandwidth on demand capability could meet your application needs

today. As well as tomorrow. We also knew you needed a cost-effective way to achieve enterprise-wide connectivity. And by the way, we knew Frame Relay could potentially put thousands of AT&T's® private lines in jeopardy. How many more reasons do we need?

To put Sprint Frame Relay, with a wide range of access options, to work for you, call 1-800-736-1130 right now.



Sprint®

1-800-736-1130

Attila the Hub

.....
When it comes to EDI, one Arkansas-based retailer figures the stick ought to be carrot enough

Dillard's Department Stores is virtually legendary in the retail industry for its strong-arm tactics to convert trading partners to EDI. When Dillard's suppliers missed their first EDI implementation deadline, the retailer charged them \$25 per subsequent paper transaction. When they missed the final deadline at the end of last year, they found themselves minus one major retail partner.

"People don't get educated unless they've got to get educated," said Dillard's EDI chief Ray Heflin. The blunt statement sums up the

Little Rock, Ark., retailer's dim view of its partners' EDI ignorance and resistance.

Dillard's also dictates that its partners work with a specific vendor for EDI connectivity and testing. And unlike Sears, Heflin chose not to provide free EDI software. "We didn't want to do any outside activity like selling hardware, software or connectivity products," Heflin said. "We're not a software company; we're a retailer."

Dillard's started out with a nice-guy approach similar to that of Sears. "I went one-on-one with sales reps and presidents, and then we held three seminars—full-day presentations of what we wanted to do with EDI and the schedules we recommend," Heflin said.

The diplomatic efforts netted only 70 percent of the suppliers, not good enough for a company with a 100 percent EDI mandate. "We stiff-armed the remainder mainly to get their attention," Heflin said.

In some cases, Dillard's got more than just attention. "Certain companies frowned on [the mandates] heavily," Heflin admitted. "There

were some trying times where wrong things got said by the wrong people."

One supplier that had run-ins with hard-line retailers is textile manufacturer Springs Industries Inc. of Fort Hill, S.C. "We did have demands placed on us, and we expressed our concern to the greatest extent possible," said C. Joe Berger, Springs' corporate director of EDI. "We don't believe in mandating."

"There are a lot of viable ways to do EDI. It's counterproductive to eliminate software and network-services alternatives," added James Davis, president of Harbinger EDI Services in Atlanta. "What should be important to the purchasing company is what comes across the EDI link."

Despite the bruises, Heflin said he is satisfied with his overall approach and recommends it to others. Diplomacy "works if you have the right words to say, if you provide some sense of EDI's benefits to them," he said. For those who still balk, well, it helps to have a big stick handy. —R. Pastore

people—information systems managers. "There is a lack of recognition that EDI is a business issue, not an MIS issue," said Dailey, who hails from a business background himself. "I get calls on EDI from [suppliers'] MIS people, and when I ask them what we buy from them, they can't tell me. It's hard to have a business discussion that way." In addition, most often it's not the IS managers who set strategic priorities; it's someone from the business side. "That's the person I want to talk to."

NO CLEAR CONSENSUS HAS yet been reached on the best way to win over partners to EDI. While some may criticize Sears' earlier soft approach as too slow and costly, many consultants call rival retailers' styles too adversarial.

Clearly Sears' nice-guy approach has taken its toll in time, staff and

"It probably does cost us more to add the trading partners at the end of the priority list. But by the same token, it costs us more to maintain two systems."

—Dailey

monetary resources, Dailey conceded. "We've been telling people about [the seminars] for 30 months now. Maybe we've done enough already—maybe it's time to reexamine the seminars," he said. Dailey is obvi-

ously frustrated and perplexed by suppliers who have not accepted his invitation to attend. "All the good intentions we've had don't seem to move them."

Perhaps more disappointing was the reception of Sears' free EDI translation software. Only 10 percent of Sears' EDI trading partners have taken advantage of the offer, Dailey said, leaving him with the dubious task of "continuing to have to sell a package we're giving away."

Some observers (including Sears' own consultants) believe firm deadlines are unavoidable for a successful EDI rollout. "Unless you apply some pressure, nothing's ever going to happen," said Andersen Consulting's Johnson. "Anytime a large customer asks someone to do something, there's a certain implied pressure anyway. It's a part of doing business."

Some suppliers understand the

need for their partners' hard line. A few even appreciate a firm nudge. Sears' mandate "forced us to do EDI, to realize it's the way to go in the future. Otherwise we would have put it off," said Richard Siegel, director of MIS at Canover Industries Inc. The Maspeth, N.Y., firm furnishes Sears stores with retail packaging, janitorial and sanitary supplies.

However, mandates will always ruffle some feathers. Sears' deadline "put pressure on me, because I wanted to maintain a good trading partnership with them, but at the same time I had other responsibilities that needed my attention," said Karlene Walden, EDI coordinator for Huffy Sports in Waukesha, Wis.

Resentment can escalate when a company dictates not only that its partners adopt EDI, but also which EDI software or network to use (see related story, Page 62). While some of Sears' rival retailers have taken this tack, Sears allows its partners to choose from among its own software and network offerings and those of approved third parties. "There was no pressure on us from Sears," said Tim Powers, key account manager at Ferodo America Inc., an automobile brake supplier in Smithville, Tenn. "As it turned out, Sears' was the most competitive network, so we went with that."

BY FAR THE BIGGEST PROBLEM with hardball tactics is their potential negative impact on EDI integration and business relationships. Strict deadlines and arrogant attitudes may be very successful at building high EDI implementation rates fast. But while partners will implement EDI if forced, they won't "buy into" the technology and make it an integrated part of their business, according to Jeff Brooks, an independent EDI consultant based in Philadelphia.

Strong-arm styles that sow ill will can also jeopardize innovative retail programs that rely on mutual partner trust. Quick-response shipping programs, for example, require retailers to furnish suppliers with vir-

The Pitch Pays Off

Even without full partner conversion to EDI, Sears Merchandising Group is already reaping the benefits of EDI efficiencies and new EDI-enabled customer-service programs.

■ **Seventy percent of incoming invoices are electronic, leading to reduced rekeying, increased accuracy and faster turnaround.**

■ **Electronic invoices allow more-detailed merchandise record-keeping, permitting cost-vs.-profit analysis at individual item level.**

■ **EDI-based programs for retail-store and catalog orders allow Sears suppliers to ship merchandise directly to customer. Sears bills customer after receiving EDI shipment notice instead of waiting for receipt-of-goods notification.**

■ **In-store customers can use EDI point-of-sale system to order wider selection of furniture directly from suppliers' warehouse inventory, rather than from Sears' limited store stock.**

tually up-to-the minute product sales data. "Anytime a retailer shares such information, it exposes itself to competitive risk, so there has to be goodwill and trust between the partners," explained Lane Cooper, assistant managing editor of the industry newsletter *EDI News* in Potomac, Md.

Close business relationships are so vital that Sears and other retailers have decided to waive EDI mandates in exceptional cases to pre-

serve them; the goal of 100 percent enrollment isn't worth any cost. "I never want EDI to jeopardize a business relationship," Dailey said, indicating that he would continue paper-based trading if it was warranted. "But the vendor won't be the one to make that call," he warned.

Sears' archrival K mart Corp. also allows exceptions. Since improving customer service is the overriding corporate mission, "it makes no sense to discontinue a product line just because the manufacturer isn't ready to do EDI," said David Carlson, K mart's senior vice president of corporate information systems. "You have to make technical compromises."

In spite of all the mandates on record, such talk of compromises and exceptions proves these firms have learned another EDI lesson: It is unrealistic to expect 100 percent EDI conversion for the foreseeable future. A more realistic and practical EDI goal would be to convert the 40 to 50 percent of suppliers that account for 85 percent of the hub company's business transactions.

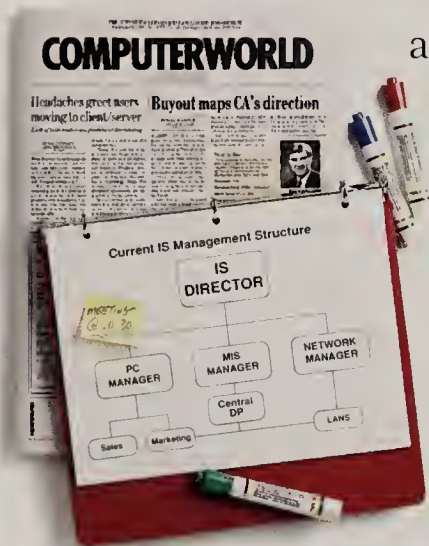
Converting the final holdouts to EDI may actually be more trouble than it's worth. "There's so much of an education hurdle to overcome, you reach the point of diminishing returns" with the final trading partners, said David Taylor, vice president of interenterprise systems at the Gartner Group consultancy in Stamford, Conn. Taylor's research shows that after declining incrementally, EDI-education costs per trading partner begin rising after a hub converts 40 to 50 percent of partners.

"It probably does cost us more to add the trading partners at the end of the priority list," Dailey agreed. "But by the same token, it costs us more to maintain two systems." Solving this catch-22 depends on which costs more, maintaining a paper system side-by-side with EDI, or coaxing the holdouts to adopt the technology. "It's a determination we have yet to make," Dailey said. That's an EDI lesson for another time. ☐

These days, technology has to serve everybody. The trouble is, everyone wants technology to do something different.



IS managers, for instance, are apt to put



a very strategic spin on things. That's because they're charged with

delivering information throughout the enterprise, integrating the company's computing and communications resources.

CIO's tend to look at the whole enterprise another way.



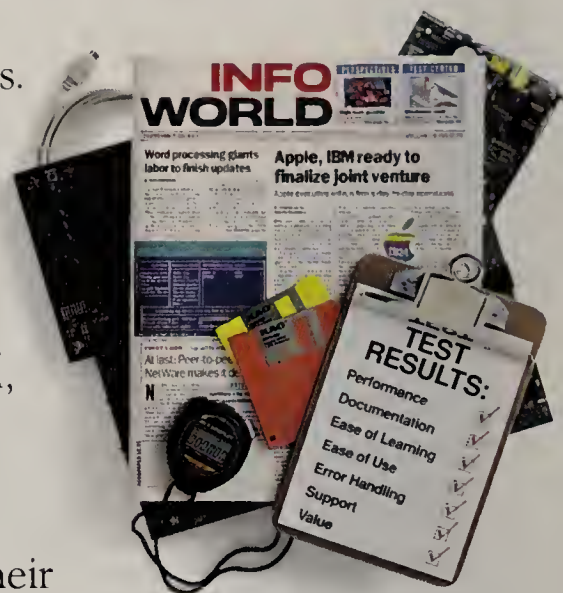
After all, they're tackling some of the very trickiest issues in business.

Like how to best use

technology to produce the greatest business management gains.

Department managers, on the other hand, have to focus on doing just what their

name implies. So they're more concerned with the productivity issues in their own backyard,



their local area networks, and generally making sure their department is happy and humming along.

End users, however, have a different perspective entirely. They see the

world from their desktop.

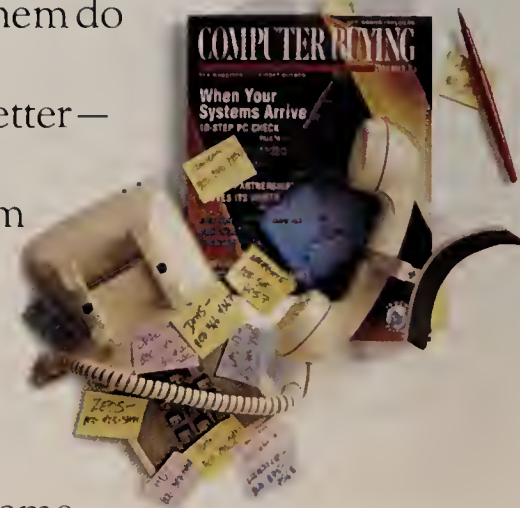
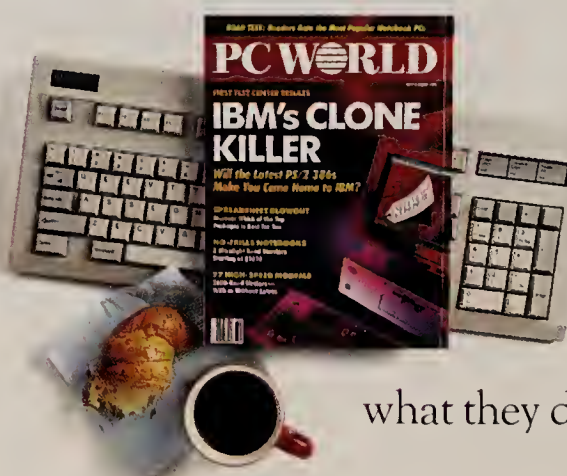
They want whatever helps them do

what they do better —

while giving them

access to the rest of the work-

group or a mainframe.



If there were only one kind of computer buyer, we'd only have one computer publication.



Then there's senior management. To them, technology is one of the best ways to gain a strategic,

competitive advantage. Or, at least, it better be.

The point is, everybody's involved. All these groups influence each other. That's why, today, there's no one person who's responsible for buying technology for the many. Instead, in the



networked corporation, there is a network of people who are responsible



for buying and implementing technology, each responding to different needs and demands.

That's why they all need different kinds of information, presented in different ways, to help them do their jobs. And why



we have more than one kind of computer publication.

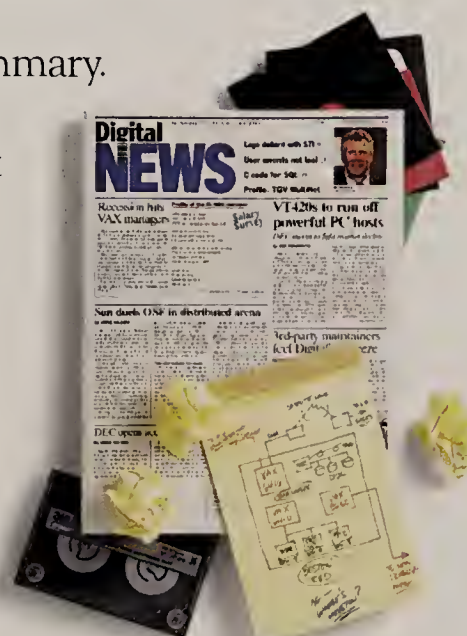
In fact, IDG has more ways to reach more of your market than anyone. We also know more than anyone about how information technology is bought, having just completed the largest independent study of the buying process ever conducted.



It's called, "Buying IT in the 90s: The People, Patterns, and Process." And we'd like to share it with you. Just call Erica Baccus, our V.P. of Marketing, at 1-617-534-1210, for a free copy of the Executive Summary.



And find out why nobody knows more about how to reach more of your market than we do.



IDG
INTERNATIONAL DATA GROUP

The World of Information Technology

© 1991 International Data Group, 1 Exeter Plaza, Boston, MA 02116, 1-617-534-1200
Brand or product names are trademarks or registered trademarks of their respective holders



What are CIOs to do about Doc Savage? The 20-year-old Arizona hacker was released from prison a few days before Thanksgiving having served his 120 days of "shock" incarceration—a cross between prison and boot camp. He faces five more years of intensive parole, including stipulations that he stay clear of modems. The youth, whose real name is Baron Majette, was arrested in March 1991 for a variety of computer crimes; he pleaded guilty last May to reduced charges. A month before he was released from prison, Majette said that he wanted

er be caught] who will join your readers' companies."

Depending on who is doing the defining, hackers are destructive electronic trespassers or harmless explorers of computer systems. Armed with inexpensive clones or hand-me-down Apples and cheap modems, hackers steal into corporate, university or government computer systems, puzzle out solutions to obstacles they encounter, and over time develop an intuitive understanding of systems. But to pay for their treks, some hackers filch telecommunications services and plunder other folks' credit cards. Still other hackers are malicious; they play destructive pranks

CYBERSPACE CADETS

Scratch a hacker,
and what do you find?
A rebel with a budding
criminal record?
Or the brains behind
your next competitive
advantage?

to go back to school and learn C and Unix. He has already learned a lot about VMS—by exploring computers. He hopes eventually to get a job as a programmer.

Would you hire him?

A number of hackers have been arrested by federal and state authorities in the last year, and many more indictments are looming. Computer-crime prosecutors hope that the crackdown will encourage other hackers to retire—which would be a terrific boon to corporate managers who are tired of flushing these hobgoblins from their networks. But the battle between law enforcers and digital delinquents raises a number of issues about information, freedom and privacy in the age of networks.

More to the point, as hackers scurry for cover, CIOs ought to think through the role that hacking plays in our culture. As one prosecutor put it, "If we don't come up with solutions [to hacking] fast, we've got a lot of young hackers [who will nev-

er be caught] who will join your readers' companies."

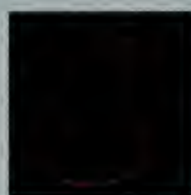
No one knows how much hacking goes on. Corporations usually deal with hackers quietly; because of the possibility of unwanted publicity, they rarely call the cops. "There are no valid figures on the subject," said Donn Parker, senior management consultant at SRI International, in Menlo Park, Calif., and a computer-crime expert. More anecdotally, though, computer-security managers say that hacking is a constant headache. A computer-security executive at one Fortune 100 company said that hackers try to get into his company's network nearly every day.

(In the interest of full disclosure, it should be noted that International Data Group, CIO Publishing's parent organization, was victimized by hackers in 1990. Disgruntled with a magazine, two teenage hackers entered IDG's voice-mail system, planted obscene messages, and caused other mischief; the estimated cost

BY THOMAS KIELY

Hacker-of-Fortune

.....
Mercenary hackers may have their modems aimed
at your company's proprietary crown jewels

 Hackers are sometimes industrial spies. Case in point: Hacker Leonard Rose pleaded guilty last March to wire-fraud charges. Government prosecutors said Rose disseminated proprietary AT&T Unix code obtained from a former AT&T employee. Meanwhile, federal agents are investigating allegations that industrial spies are employing the talents of hackers based in Detroit, and rumors swirl in computer-law circles about a group of French hacker mercenaries known as QSD.

Hacker spies put a double burden on CIOs, according to William Cook, a lawyer with Willian, Brinks, Olds, Hofer, Gilson & Lione in Chicago. Not only do CIOs have to protect their own companies' computer-based trade secrets, Cook explained; they must also "ensure that [the company's] resources are not being abused by dishonest employees who are using [the organization] as a front to go out and steal secrets from other people—thereby exposing [it] to an incredible level of liability."

It isn't just the CIO's problem, added Don Ingraham, an assistant district attorney in Alameda County, Calif., and one of the nation's most experienced technology-crime prosecutors. "CIOs have an ethical responsibility to bring some of the vulnerabilities of the new technology to [the attention of] top management," he said. But to implement an effective bulwark against hacker spies—whether they are employees or interlopers—requires the concerted efforts of managers in security, personnel and operations departments, as well as IS. —T. Kiely

for repairs and system fixes amounted to \$70,000.)

Trespassing is just one aspect of hacker crime. Teenagers can't afford the telephone bills they run up in hacking sessions. Instead, many of them "liberate" lines from the Baby Bells, loop themselves through PBXs, or use stolen toll-billing numbers. Some hackers purchase computer equipment with purloined credit-card numbers (some teens working in retail stores collect numbers, while other kids rummage through trash looking for discarded Visa or MasterCard slips); they trade these numbers with other hackers for computer passwords. Hackers have also downloaded software and information from systems they have raided.

Not all hackers indulge in harder crimes. In fact, most see themselves as explorers of cyberspace—a virtual world sired by layers of networks and communications highways. "Hackers aren't out to destroy or to

be malicious," said Emmanuel Goldstein, editor and publisher of the hacker journal *2600*. "If they were, you'd see AT&T crashes every day. There is an unwritten ethic for hackers. Hackers aren't getting into personal files; they're exploring systems."

But aren't the corporate systems hackers explore private, too? Goldstein sees that as a one-sided argument. "If I want to access a credit[tracking] company like TRW and access my credit file, is that an invasion of TRW's privacy?" Goldstein asked. "What about my privacy—all that information they've gathered on me?"

CIOs find Goldstein's arguments alien and disquieting, but Goldstein blasts IS professionals and law enforcement for their "ignorance" of hackers. Moreover, in the gap between the two can be found numerous middle positions—a variety of distinctions between good hackers and bad. The difficulty with finding a so-

lution to hacking or, indeed, even identifying the challenges posed by hacking, arises from a lack of consensus about what is permissible in cyberspace.

Into that breach rode Lotus Development Corp. founder Mitchell Kapor. In 1990, Kapor, chairman of ON Technology Inc. in Cambridge, Mass., helped launch the Electronic Frontier Foundation (EFF), an organization that hopes to raise popular (and government) understanding of the implications of new information technologies. The Foundation also champions the search for reasonable guidelines that would distinguish computer crime from computer rights. Along with Harvard Law School professor Laurence Tribe (who has proposed passage of a constitutional amendment to reaffirm constitutional rights in the information age), Kapor fears that government, in an effort to staunch computer crime, will trample on civil liberties.

Kapor's concern is not unfounded—the EFF was created in response to specific cases. One involved Craig Neidorf, a University of Missouri student and an editor of *Phrack*, an electronic newsletter. Neidorf was indicted in 1990 for reprinting a proprietary BellSouth text file obtained from a hacker. Neidorf argued that the government had abridged his First Amendment rights to publish, and that anyway the BellSouth material was widely available in the public domain; the government dropped the charges soon after his trial began.

In a related case, U.S. Secret Service agents raided Steve Jackson Games Inc., a role-playing-games company headquartered in Austin, Texas, in March 1990. One of Jackson's employees was a subscriber to *Phrack* and proprietor of a bulletin board (essentially an electronic message center) on which he re-posted the BellSouth file; the employee was also loosely affiliated with the hackers who originally stole the file. The feds swooped down on both employee and employer, confiscating a few of the company's computers and much

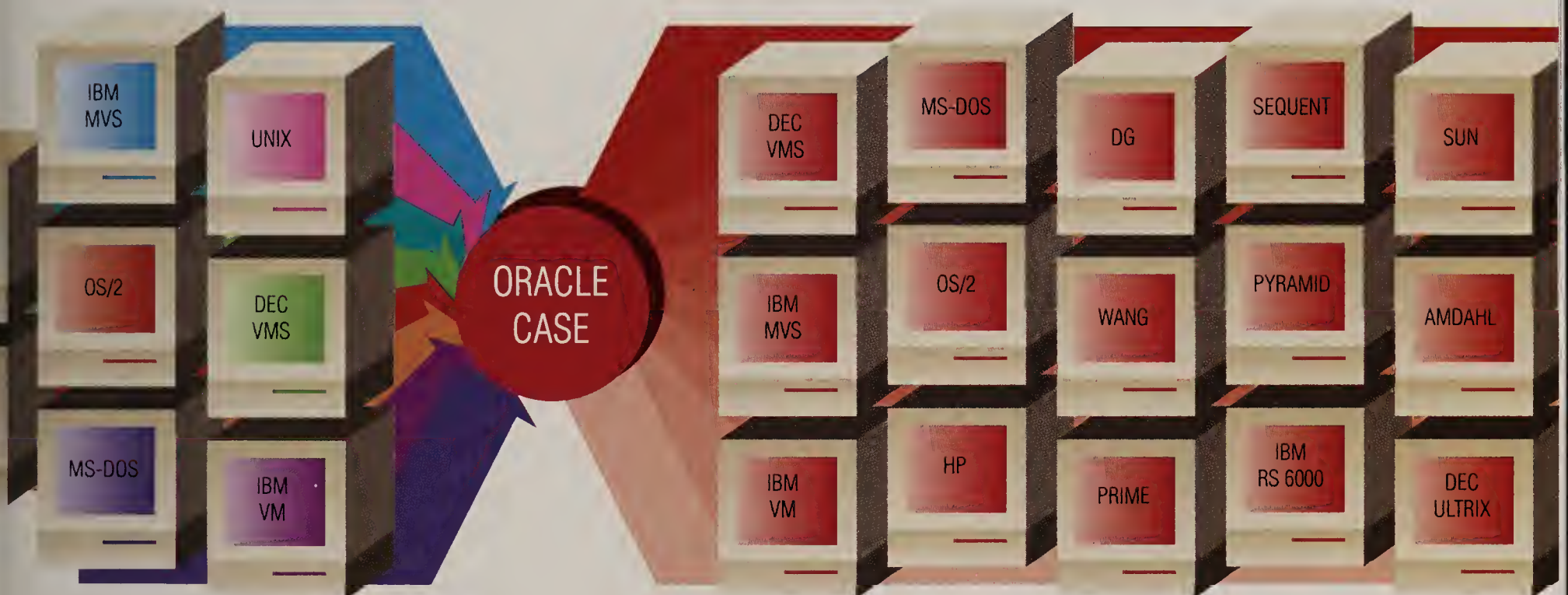
Only Oracle CASE allows teams of developers to jointly design and build database applications that run on virtually all the computers in your organization. Mainframes, minicomputers, workstations and PCs.

Oracle CASE supports the full lifecycle of systems development. From strategic planning, analysis and design to on-line generation, production and maintenance. Using sophisticated diagrammers for entity-relationship models, function hierarchies, dataflow analysis and matrices. All integrated with a comprehensive set of application development tools and utilities.

Oracle CASE lets you develop applications anywhere. And run them everywhere.

Developers' efforts are fully coordinated via a shared, on-line repository. Which can reside on virtually any platform, and be accessed by just about any combination of terminals and

workstations. So developers can truly work as teams to improve productivity, while eliminating errors and redundancies.



And once CASE generates your application, you can run it on virtually all your computers. From PCs through mainframes. Oracle also offers comprehensive services to transfer our CASE expertise to you. Including full support, education and consulting to maximize your success with CASE technology.

1-800-633-1059 Ext. 9635

Call us now, and register for the free Oracle CASE Technology Seminar in your area.

You'll see why Oracle offers the best CASE scenario.

ORACLE®

Software that runs on all your computers.

© 1991 Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. All other trademarks referenced are the service marks, trademarks, or registered trademarks of the respective manufacturers. Call 1-800-ORACLE1 for hardware and software requirements. *In CANADA please call 1-800-668-8925 for product and seminar information.

important data, including a game manuscript the company was readying for the printer. While the authorities have since returned most of Jackson's equipment and data, the whole episode cost the company plenty. "Guilt by association three times removed is pretty far out there," said Steve Jackson, the firm's owner.

Resolving definitions in cyberspace will take some time. For instance, what is a bulletin board? "Is [it] a public forum and entitled to constitutional protection as freedom of speech?" asked Jackson. "If [it's] a forum, what about freedom of assembly? Likewise, is the proprietor of the bulletin board a publisher—and is freedom of the press an issue?" Or are bulletin boards, as Tribe has suggested, like bookstores—free from government regulations and not liable for their contents?

For hackers, bulletin boards are the electronic version of the street corner in front of the malt shop. Here, hackers swap phone numbers for corporate computers, passwords, pirated software, tall tales, credit-card numbers, customer billing codes, hacking tips, games, gossip and any other lore they would trade under the humming neon ice-cream cone. It is the rare teenager who is troubled by distinctions between legal and illegal information.

While some hackers are simply criminals or sociopathic delinquents, breeds that have always been with us, thousands are just typical teenagers—testing limits, morally jumbled, given to pranks. Unfortunately, pointed out John Lee, professor of computer science at Virginia Polytechnic Institute and State University in Blacksburg, Va., the technology that allows hacking advanced rapidly in the 1980s, while society paid scant attention to the phenomenon of teenagers with access to PCs. As a result, Lee believes, hackers possess powerful networking tools but have little understanding of the harm they can cause in their explorations.

Lee, who chaired a 1986 Associ-

ation for Computing Machinery panel on hacking, strongly urges creation of computer-ethics courses for kids—and the earlier kids are taught, the better. But Kapor is skeptical of the idea. "If you haven't learned what's right and wrong by the time you get into high school or college, you won't get that from a course on computer ethics," he said. "I don't think that's a real fix."

"Is a bulletin-board system a public forum, and entitled to constitutional protection as freedom of speech? If it's a forum, what about freedom of assembly? Likewise, is the proprietor of the bulletin board a publisher—and is freedom of the press an issue?"

—Steve Jackson

The psychology of hacking is only dimly understood. Speaking from his Arizona prison, Doc Savage (Baron Majette) called hacking an addiction. "This inmate never had a drug problem, sir," the youth said. "And never a drinking problem. But with computers, sir, it was like an addiction."

Gail Thackeray, the prosecutor who convicted Majette, said much the same thing—and it is a phenomenon that clearly shocks her. "I think it's a behavioral addiction, like gambling," she said. "The recidivism rate is terrible.

It's frightening. You have 15-year-old kids who, if forced to give up the computer, will give up mom and dad instead. They'll leave home rather than give up the hacker network."

Thackeray said the old stereotypes of the hacker just don't apply; the hackers she sees aren't lonely nerds. They're kids of all sorts, from good families and bad. "They're altar boys, they're the captain of the swim team—and they're also criminals," she said.

The allure is multifaceted, said Lee and others. Hacking is a kick in part because it is illegal, and deliciously antiauthoritarian—hacking is usually directed at impersonal organizations rather than at individuals. It is a way to explore the unknown, to reckon one's way around obstacles, and each hurdle overcome is a trophy to boast about. Hacking is power; the "addiction" is to control, as MIT professor Sherry Turkle and others have pointed out. Some hackers are outsiders who see themselves as an elite; others are cyberspace mechanics building password-stripping programs rather than rebuilding carburetors; still others are video-game players. Until recently, hacking was largely a risk-free sport. And it is fairly impersonal—hackers don't usually see the consequences of their actions.

"Because it's so depersonalized and so anonymous, it leads to moral breakdown," said John Maxfield, a computer-security consultant. "Hackers don't get any feedback on [their] wrongdoing. There's no face-to-face contact, no inflections of voice, no body language. Nothing." Alameda County, Calif., Assistant District Attorney Don Ingraham agrees. "The main problem is that they can't distinguish between raiding General Motors and raiding the Mario Brothers," he said. "That's a reality problem."

"It escalates," Doc Savage explained. "Once you start earning a name, people want to contact you and ask questions [about your exploits]. It's hype. But then this individual started taking risks, sir. This individual started pulling pranks and



New technology can seem a little intimidating.

Investments in information technology have reached 40% of U.S. capital spending. Yet national productivity has not improved since 1973.

So anxiety over new spending is justifiable, even healthy. The evidence is that hardware

alone doesn't pay off. Which is why Andersen Consulting offers something even more powerful.

A way for your organization to seamlessly link technology to your strategies, operations and human resources.

This is a balanced, realistic

approach that puts fear where it belongs. In your competition.

**ANDERSEN
CONSULTING**

ARTHUR ANDERSEN & CO., S.C.

Where we go from here.SM

Hack- Prevention Tactics

.....
Computer-security
experts and computer-
crime prosecutors
recommend
five ways to
foil hackers:



- ▶ Write a "warning" message that will greet all dial-in users. The warning should clearly state that the system is private and available only to authorized users.

- ▶ Keep company employees informed about the latest twists in computer crime, and suggest ways they can help batten down the security hatches.

- ▶ Review end users' computer and telecommunications passwords; reject obvious ones, such as common words or names.

- ▶ Monitor long-distance telephone traffic; if the traffic suddenly spikes, immediately alert your carrier—you may have hackers in your PBX.

- ▶ Keep up with reports on intrusions elsewhere; learn how they occurred and make the appropriate plugs in your own system.

—T. Kiely

getting bolder."

Still, many teenage hackers eventually grow bored with late-night sessions, move on to other interests and eventually grow up. But like Doc Savage, most hackers dream of computer-related careers. Should their dreams come true?

In reality, the computer industry has been employing hackers for years. In the 1960s, Lee observed, hackers at MIT, Berkeley and elsewhere championed "free access" to com-

puters. They created early computer games, played pranks and shared software, and then went on to work in an industry that created interactive computers, personal computers and a plethora of innovative software applications. The founders of Apple hawked "blue boxes"—electronic devices used to make free long-distance phone calls—before they developed their personal computer. Many creative programmers honed their earliest skills by hacking.

Companies also hire known hackers as security consultants. One such consultant is Chris Goggans. Once known as Eric Bloodaxe, Goggans was one of the original founders of the Legion of Doom hacker group, and comanager of the bulletin-board system that played a role in the raid on Steve Jackson's office. Last year, Goggans and two other former Legion of Doom hackers cofounded the Houston-based computer-security firm Comsec Data Security Inc. Goggans says the firm already counts a telecommunications company and "investigative services" among its clients.

Moving from the computer underground to computer security "is a logical progression," Goggans argued. Hackers probe the security of computer systems from the other side of the modem, as it were.

What does Goggans bring to the table? Eleven years' experience with security holes, and expertise gained by exploring in Unix-based operating systems, telecommunications applications, VMS, PRIMOS and other systems. "Our information is real-time," Goggans said, taking a swipe at competing security consultants. "We're trying to bridge the gap between [computer security] theory and applications." Put another way: Goggans's job now is to plug security holes—in essence to prevent other hackers from learning systems the way he did. "It is kind of ironic," he admitted.

SRI's Parker thinks that all this is just bonkers. Hackers shouldn't get jobs at all. "We've got to kill the hacker ethic," he said. "Computer-technology professionals need to more

strongly condemn the actions of young [hackers]. And they have to put that into action by refusing to hire hackers."

Maxfield and other security experts point out that insider hackers—whether employees or consultants—are a far more serious threat to corporate security than teenagers fishing for passwords. Added William Cook, a lawyer with Willian, Brinks, Olds, Hofer, Gilson & Lione, headquartered in Chicago: if you hire a hacker, you had better let your insurance underwriter know. You could be jeopardizing your company's "errors of omission" and "directors and liability" insurance policies.

In most cases, though, information executives won't know they are hiring a hacker or a former hacker. After all, how many managers know whether or not their employees indulged in a little vandalism when young? Should managers worry about that?

"Absolutely," said Cook, the former U.S. Attorney who prosecuted Neidorf. Cook argues that information managers should make all new employees and consultants sign employment agreements. "These must lay out clearly what the scope of [each individual's] authority is," he explained. These agreements should cover in detail what information and systems each employee is allowed to access, right down to the source code. Systems administrators must police these agreements, which act as deterrents to computer crime, and if necessary provide solid legal evidence later on that a hacker knew full well that he or she was crossing a forbidden line.

But agreements like this can sour some workplace cultures. At a time when employers are looking for creative employees—problem solvers, risk takers, riddle unravelers—the best and the brightest candidate may be a secret hacker, or former hacker. Once inside the company, some gifted youth could prove to be the genius behind a new application, or else the embezzler from hell.

And how will you know? ☐☐



SOME GREAT REPUTATIONS ARE BUILT ON A SINGLE FOUNDATION.



Namely, Motorola's 88000 RISC microprocessor. It's the only architecture that ensures hardware compatibility and "plug and play" software interoperability between diverse UNIX systems.

The 88000 advantage is the result of a commitment made by each of the companies you see here—all members of 88open. By adhering to a set of certified standards, they've made it possible to protect your computer investment well



into the future of Motorola's RISC offerings. That's why 88000 is the foundation for an impressive range of desktop computers, workstations, servers and supercomputers, in addition to more than 300 fully compatible software packages.

So if you want to be assured of exceptional performance and long-range security, call 1-800-441-2447 for a complete listing of 88open members. And take advantage of some of the best reputations in the business.



MOTOROLA

Team Tactics

Empowered, self-managing teams are proving the most potent weapon in the competition for internal customers at Corning's IS organization

BY HARVEY SHREDNICK, RICHARD SHUTT AND MADELINE WEISS

Over the past year, the IS organization at Corning Inc. has radically changed its business relationship with internal customers from chargeback to services for sale. In effect, the businesses outsource to IS, which must compete with outside IT service providers.

IS is banking on total quality management as its most powerful weapon in the competition to serve Corning customers. While IS has incorporated all key elements of the company-wide total-quality process, its status as a high-performance organization, characterized by employee empowerment, has contributed most to its success. The basis for that empowerment is self-managing teams—groups that are responsible for accomplishing a mission with little or no supervision.

The team concept is nothing new to Corning, where for years employees have worked in cross-functional quality-improvement and corrective-action teams. IS participation on such teams now exceeds 90 percent. This culture of involvement and commitment laid the groundwork for the self-managing teams now springing up across IS; these teams

are changing fundamentally the way work is organized and services delivered to internal customers.

While the company's use of self-managing teams is relatively new—the oldest just celebrated its third anniversary—their impact on both IS and the quality of its customer service has been dramatic. For example, teams have significantly increased customer satisfaction because members are better positioned to understand customer requirements and move quickly to meet them. In most companies, increased customer service carries a higher price tag. At Corning, however, costs have actually gone down, due to a reduction in layers of management and the redeployment of personnel to other areas. IS can already point to savings of more than \$500,000 on a \$5 million budget.

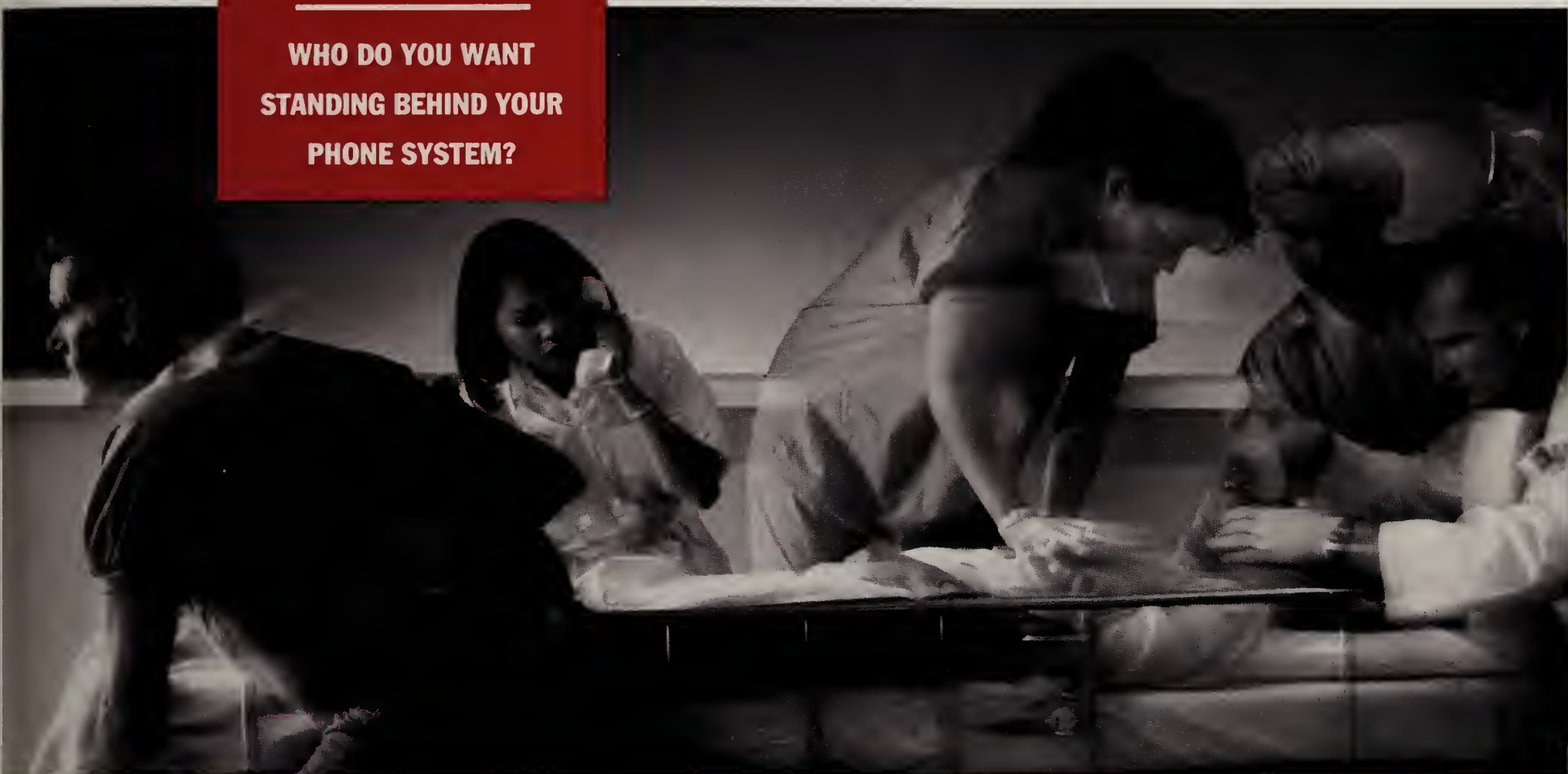
The organization is also making better use of staff and providing them with greater opportunities to learn and use new skills and knowledge. Corning's IS organization is composed of nine departments, with an IS management team performing an administrative function. Here are some examples from three departments:

Computer Utility: The customer-service team in this department, which handles almost 3,000 calls per month from internal customers, upgraded the help line into a premier service. Team members sought additional education so they could expand services from mainframe to mid-range systems and PCs. The percentage of calls resolved on the spot has risen to nearly 90 percent, from 75 percent at the help line's inception in July 1988. Continuous improvement is assured through a raft of initiatives to measure quality, including monthly surveys of selected customers and tracking of call handling and abandonment.



**WHEN OVER 75,000 LIVES
ARE ON THE LINE**

**WHO DO YOU WANT
STANDING BEHIND YOUR
PHONE SYSTEM?**



When life or death is just a breath – or a phone call – away, you don't pick an ordinary phone system.

You pick one that's based on the simple design premise that *all calls can get through!*

But Fujitsu's non-blocking architecture wasn't the only reason that New England's newest medical center – the \$218-million Dartmouth Hitchcock Medical Center (DHMC) – selected their F9600 digital PBX to take it into the 21st century. DHMC also wanted a system that was compatible with their existing phones. A system that transmitted voice, data, fax and video images to 4,700 terminals over a seven-mile network of fiber optic cable.

And a support team committed to Integrated Services Digital Network (ISDN) applications.

The answer was Fujitsu, a \$21-billion global telecommunications and computer leader serving over 100 countries.

To see what answers the F9600 has for you, call 1-800-553-3263.



The F9600 Digital Telephone from Fujitsu, a \$21-billion global telecommunications leader serving over 100 countries.

FUJITSU

The global computer & communications company.

The two technical-services teams in the Computer Utility consist of specialists in IBM mainframe hardware and software and Digital's mid-range computer technology. Instead of competing for business and resources, they now make decisions on how best to use their shared resources to meet customers' business needs. Recognizing the growing customer demand for mid-range applications, the teams recently decided to train an IBM specialist in the Digital world.

The operations team in the Computer Utility consists of all operators of corporate mainframe and mid-range computers. Improved teamwork within and across the three shifts has led to dramatic reductions in operator errors. (In 1990, 70 percent fewer errors were made than in 1989.) The team treats the computer room as its own shop, taking pride in preventing problems, improving operations and saving money.

Technical-services team members share their knowledge so that operators can monitor systems more proactively. Several team members have moved from operations to other teams and units—something that rarely occurred in the traditional operations function. The team replaced these operators with new employees, all of whom have contributed significantly to operations.

Recognizing the value of sharing their experiences and achievements, team members have made presentations at Corning's annual corporate-wide quality-recognition event and at IS's annual off-site management conference. Teams also host groups from other corporations who view them as a benchmark.

Administrative Center: A self-managing IS team develops and supports applications for a newly consolidated division responsible for corporate administrative functions ranging from accounts receivable and payable to payroll and insurance. Working closely with its customers, the team evaluates requests and sets priorities, ensuring optimization of IS resources.

Team members share programming practices and solutions and have developed formal standards and procedures. The increased number of method-improvement requests sub-

IS team members now replace insurance-claims employees at the telephones, freeing them up to attend training sessions.

mitted by team members (from one the first year to 50 last year) is just one measure of enhanced commitment to improving customer service.

Customer support also surpasses traditional expectations. For example, IS team members now replace insurance-claims employees at the telephones, freeing them up to attend training sessions.

Communications Network Services: Teams in this division have re-engineered their functions, simplifying workflows and reducing cycle time. A customer-service function was added and a new billing system is being designed with a front end to support customer-service team members—all without adding positions. Employees who had been locked in the same job for over 20 years were able to move into new areas.

The product-strategy team in Communications Network Services includes product managers (former supervisors and first-line managers), who manage and market the telecommunications services IS offers its customers. Team members encourage problem solving across teams, acting as coaches and third-party facilitators. Two team members also act as advisors to other teams.

Meanwhile, the IS management team is learning how to adjust just its own behavior in order to sustain this major cultural change. While managing by the numbers is an integral part of TQM at Corning, IS management must be even more vigorous in its measurements and in sharing the results of those measurements with teams. The management team is also searching for the best ways of rewarding individuals and teams based on results.

In addition, the IS management

team is learning to be a "barrier buster," adjusting the practices and systems that do not yet take account of the empowerment of teams. For example, supervisory signatures are still expected on job descriptions and expense reports, and many senior managers feel uncomfortable receiving phone calls from team members.

The IS management team must pay particular attention to middle management and supervisors. It is not surprising that some middle managers and supervisors view team empowerment with suspicion, uncertainty and resistance—perceiving a threat to their own power and influence. They realize that their repertoire of management skills, often the product of years of experience and struggle, will become at least partly obsolete, and they worry that they won't successfully master new coaching and facilitating skills. These managers and supervisors need support from their managers and peers (especially those who are further along in their transitions), as well as training.

Despite all the progress, it is easy to fall into old ways of doing business. For example, when Corning recently hired a new director for the Computer Utility, no one on the IS management team thought to involve Utility team members in the hiring process. Fortunately, team members pointed out the oversight.

Now that IS services are for sale at Corning, the term "customer" has taken on new meaning. Total customer satisfaction is more than a phrase: It is the "vital" goal for 1992. Overall, the implementation of teams has unleashed energy, creativity, commitment and ownership in IS. The sense of pride in satisfying—even delighting—the customer is evident throughout the organization. Empowering staff through self-managing teams is proving the means for enlisting the minds, hearts and spirits of IS members in the effort to deliver world-class service. ☐

Harvey Shrednick is vice president of information services and Richard Shutt is director of applications development services at Corning Inc. Madeline Weiss is president of Weiss Associates Inc., a management consulting firm in Bethesda, Md.

How do you measure the quality of a field service company?

With a Richter scale.

October 17, 1989. 5:04 p.m. PST. A devastating earthquake strikes the San Francisco Bay area. Communications out, networks fail, computers down.

As always, Novadyne was ready. Our field engineers loaded a mobile repair vehicle with anticipated parts and equipment and drove all night to the stricken area. Working non-stop, they brought two sites online within hours. And a short time later, had several other customers up and running.

This emergency may have been unusual, but not Novadyne's response to it. Because even in the most extraordinary circumstances, Novadyne delivers.

With top quality, nationwide maintenance on DEC,[®] Tandem,[™] Sun[®] and McDonnell Douglas[®] installations as well as hundreds of other peripherals manufacturers. Expert, highly trained field engineers and technicians. Automatic call tracking and escalation systems. A multimillion-dollar spare parts inventory. And round-the-clock availability.

Contact us today at 1775 East St. Andrew Place, Santa Ana, California 92705-6560, (800) 826-4944. We're ready to be your field service company.

No matter what scale of emergency.

The Power Of Many Combined As One.



NOVADYNE[™]

All trade names referenced are the service marks, trademarks or registered trademarks of their respective manufacturers. © Copyright 1991 Novadyne Computer Systems, Inc. All rights reserved.

FYI

Mail on the Fly

AT&T and SkyTel Corp. are helping to tighten corporate ties by "untethering" the workplace with an international Wireless Mailbox service. This service links AT&T EasyLink electronic mail and SkyTel's international satellite services with a new notebook computer from AT&T Safari Systems.

With SkyTel's network and the SkyTel Link (a pocket-sized message receiver and interface adapter), Safari notebook users can receive electronic mail at any time anywhere in the United States, Canada and Mexico. (The companies have plans to expand the service to the United Kingdom eventually as well.)

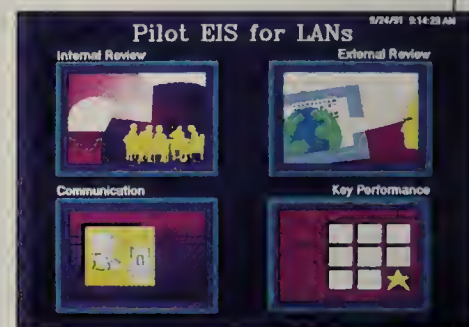
A signal from an alphanumeric message receiver notifies users that they have incoming mail. Users can connect the receiver to the notebook and download messages for viewing, editing and storage. Mail can also be read on the receiver itself, which captures and stores 20 messages of up to 240 characters each. And messages can be broadcast simultaneously to multiple mailboxes.

The Safari Wireless Mailbox package retails for \$450, including the SkyTel Link and message-retrieval software. SkyTel service starts at \$48 per month. SkyTel can be reached at 800 456-3333, AT&T Safari Systems at 800 247-1212, EasyLink at 800 321-6747.



LAN Rover

Decision-makers need access to data from many sources distributed across multiple platforms. So it makes sense that Pilot Executive Software has released a version of its EIS for local area networks. Over a LAN, Pilot users can not only access data from multivendor sources; they can feed data to other desktop applications such as spreadsheets and word processors as well. Along with its LAN-based EIS, Pilot unveiled TimeBase, a back-end, multiuser, multidimensional database server. Unlike conventional relational databases, TimeBase allows multidimensional data queries that include parameters of time. An EIS starter kit costs \$40,000 for 15 users and three developers. Call 617 350-7118.



Snap Shots

Throw out those old photo albums. Polaroid Corp. has a better idea. The maker of instant film and electronic imaging technology recently introduced a new desktop photo scanner that allows users to capture color images on a computer quickly and inexpensively. With Polaroid's new CS-500 color photographic scanner, users can digitize, manipulate and store images that are 4 inches by 6 inches or smaller in 12 seconds or less. The images can be merged with text for desktop publishing or converted to 35mm color slides using Polaroid CI-3000 or CI-5000 Digital Palette Computer Film Recorders. Users can also scan images into a computer database in order to electronically store color photographs with related forms or files. The CS-500 will capture a snapshot at 500 dots per inch in 24-bit color. Available now for use with Apple Macintosh II computer systems, the CS-500 lists for \$3,495. A Windows version of the scanner, for use with IBM PC-AT and compatible systems, will be available in the first quarter of 1992. Call 617 577-2000.



Open Sesame

Some people are so predictable! And hackers have taken advantage of that predictability, exploiting easy-to-guess passwords to break into systems, sometimes causing millions of dollars in damages. Now Password Coach, a new product from Baseline Software, promises to help organizations protect what has become the Achilles heel of computer access-control systems.

Password Coach bolsters Novell Netware security by subjecting user-chosen passwords to 39 different strength tests. If users select easy-to-guess passwords, the package engages them in a dialogue until a strong password is created. Password Coach ensures that passwords are not in the dictionary, and it prevents users from employing such vulnerable choices as derivatives of their user IDs, common first and last names, reversed dictionary words and selected cultural icons.

The software comes with a 140,000-plus English "weak password" dictionary, which can be customized to include organization-specific words and material that can be extracted from files (names, phone numbers, etc.)

Price is \$795 to \$1,495 per server. For information call 415 332-7763.



I told my boss:

“BELL ATLANTIC CAN'T POSSIBLY handle our PHONE SYSTEM needs!”

Mr. DARWIN BEAL, EX-TELECOM MANAGER. CURRENTLY TRAINING for POSITION as PROFESSIONAL WRESTLER.



Outmoded phone systems and an overwhelming increase in calls are wreaking havoc on companies' communications. Unfortunately, what many telecom managers, like Darwin Beal, don't know is that the companies of Bell Atlantic[†] may offer the best solution to those telecommunication problems.

[Unique Solutions.] Bell Atlantic can customize phone systems that cost-effectively link multiple locations and increase call capacity. And nobody else has Bell Atlantic's experience in providing Centrex and PBX solutions. So we can tailor a system that's exactly right for you.

These state-of-the-art switching systems allow you to add powerful new capabilities, with enhancements like Voice Mail, automatic call distribution and voice response, for even greater productivity and savings.

And because we offer the leading brands of equipment, we can provide you with the best products for your

needs (PBX or key system). From such manufacturers as Northern Telecom, NEC and InteCom.

[We support what we sell.] When you buy from us, you get service from us. So you always have a single source to turn to for designing, installing, repairing, and growing efficient local voice networks. And we can develop a service assurance program to keep your phones working should your system go down.

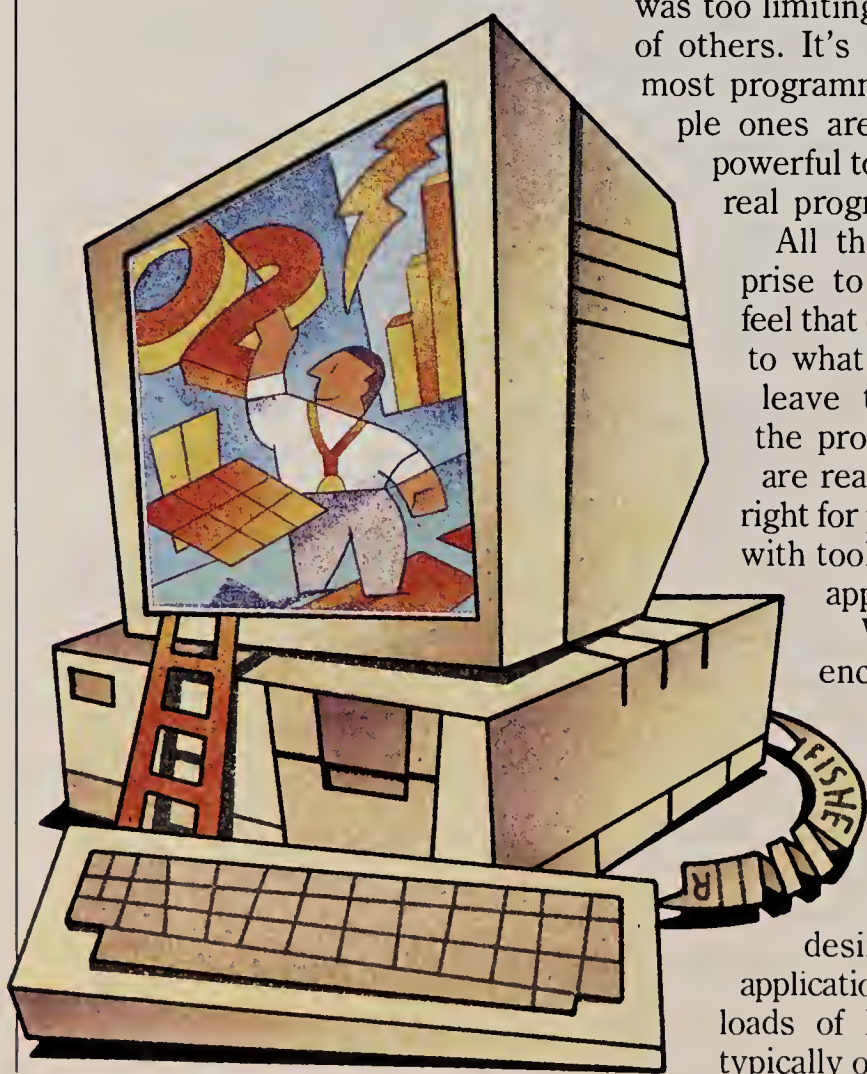
If an obsolete voice system is hindering business and annoying your customers, don't disregard what may be your best option: Bell Atlantic. Darwin would no doubt agree. For information, contact your Bell Atlantic account representative or call 1-800-522-6607.

© Bell Atlantic
We're More Than Just Talk.®

Helping Users Program

Most end-user programming tools fall short of users' imaginations and exceed their capabilities. But IS can offload some routine tasks, and quench the growing thirst for user involvement, by getting the right tools to the right users.

BY LUCIE JUNEAU



The term "end-user programming" has been kicked around for a while, but very few vendors have introduced programming solutions for end users. The problem is that no one has come up with a way to make programming easy.

Experienced users have been programming on a rudimentary level for some time, building DOS batch files and creating macros within spreadsheets and word-processing packages, for example. But even these power users find it difficult to work with sophisticated programming tools. And more typical users are out in the cold.

When Claris Corp.'s HyperCard made its debut, it promised to turn Mac users into programmers. But while it was too difficult for some users, it was too limiting to satisfy the needs of others. It's the same story with most programming tools: The simple ones aren't very useful, and powerful tools inevitably require real programming expertise.

All this comes as no surprise to IS managers. Many feel that end users should stick to what they know best and leave the programming to the professionals. But there are reasons why the time is right for providing power users with tools to create their own applications.

With years of experience under their belts, some users are now quite comfortable with computing concepts. Given the proper tools, users who indicate a desire to create their own applications can ease the workloads of IS staffers, who are typically overburdened with us-

er requests. The key is to provide tools that users can master relatively quickly, and then to provide the ongoing support they'll need to be productive.

Most programming solutions on the market today are designed primarily for applications developers. But many of these products, particularly those for windowing environments, are becoming easier to use, and some are being put to use by venturesome end users who don't mind scaling a learning curve.

Visual Programming

Two basic innovations in programming techniques are simplifying the application-development process. One is the introduction of visual, object-oriented programming, and the other is a move to abbreviate the traditional development cycle, which typically includes program design, prototyping, coding, testing and debugging, maintenance, and documentation.

The appeal of visual programming is that it makes something abstract more concrete. Users create their programs right on the screen, describing program functions with pictures instead of words. The traditional programming language is replaced by visual tools, typically including icons and/or data-flow diagrams. Mapping out an application with these tools can be easier than writing lines of code, particularly for visually oriented people who prefer using graphical user interfaces (GUIs) to entering commands.

Visual programming tools are typically coupled with object-oriented programming: The icons on the screen represent preexisting objects, or sets of data and defined procedures. Because programmers using object-oriented tools combine precompiled objects rather than write lines of code,

XEROX

MetLife gave Xerox Printing Systems their stamp of approval.



MetLife's Group Department and Xerox put together a system that yields impressive benefits. It's a system that combines Xerox intelligent laser printers with customized finishers. The new system helped stamp out over \$500,000 in costs related to mailings.

Specifically, this system helps MetLife avoid redundant mailings while putting payment documentation and drafts, destined for the same customer, in the same envelope. The system also verifies correct document match, provides an audit trail of payments, and automatically counts the number of pieces mailed.

All told, MetLife's Group Department has used Xerox solutions to avoid spending over \$3,000,000 each year on document production. That's \$3,000,000 that doesn't get passed along to the customer.

With Xerox printers, you too have the opportunity to produce claim forms, explanation of benefits and checks, provider directories, and much more. Like MetLife, you could be simultaneously producing high-quality documents, faster and for less money, while improving customer service.

Call us at 1-800-TEAM-XRX, ext. 136B. You'll probably find out that our solutions will get your stamp of approval as well.

XEROX
The Document Company



the process of creating a program is more like building a structure by assembling prefabricated rooms than building a house from the ground up.

For end users, learning to program isn't an end in itself. Many PC users who express an interest in programming tools are looking for ways to access and manipulate data in corporate databases. If they can get at the data they need and put it to use without building an application from scratch, so much the better. Conversely, if a programming tool doesn't help them address their problems, they'll quickly lose interest in it.

Many users rely on database-management systems and database-access tools to retrieve the data they need from central databases. Some of these tools, like many of the newest general-purpose application-development tools, are object-oriented and designed for windowing environments. They enable users to create database applications using visual programming tools.

Oracle Corp.'s Oracle Card, an object-oriented tool, allows users to build Microsoft Windows-based graphical front ends to information in Oracle databases. It uses a stacking paradigm similar to HyperCard's: Users build cards using icons from a toolbox and then link their cards to create applications, or stacks.

Another tool for creating database applications is Odesta Corp.'s Double Helix. An object-oriented, relational database-management system for the Mac, Double Helix includes visual programming utilities. Users create applications by positioning icons called tiles on a display and using arrows to specify relationships.

Tools for creating general-purpose, stand-alone programs include Serius Corp.'s Serius Programmer, an object-oriented, visual programming product for the Mac. Users select icons representing the objects and functions they need to build their programs and then connect these objects and functions by drawing lines between the corresponding icons on the screen. There's no coding involved.

Serius Programmer, like some other object-oriented programming environments on the market, comes in both "A" and "B" versions—one offering only predefined, precompiled objects for manipulation, and the other enabling programmers to create additional objects and functions using a traditional programming language. Even the prefab version of Serius Programmer will challenge most end users because it requires an understanding of loops and other fundamental programming concepts.

Many of these products are becoming easier to use, and some are being put to use by venturesome end users who don't mind scaling a learning curve.

One product that some business users may find easier to master is Borland International Inc.'s ObjectVision. A Windows-based, object-oriented programming environment, ObjectVision provides links to several databases, including Paradox, Dbase and Btrieve.

Like Serius Programmer, ObjectVision doesn't require the use of a procedural programming language. An ObjectVision programmer creates a user interface for an application by placing fields on a form. To complete the application, the programmer uses decision trees that make use of spreadsheet-style formulas to determine the form's field values. End users familiar with flow charts and spreadsheets may be comfortable with this approach to application development.

ObjectVision is good for creating the kinds of applications that incor-

porate database data and can be adapted to the forms paradigm. Borland recommends it for generating applications that estimate costs, calculate employee benefits, and compute insurance premiums and deductions, for example.

Trading Speed for Ease

One drawback of visually based programming tools like ObjectVision is that they trade speed for ease of development. Most visual programming languages are interpreted, and therefore generate programs that are slower than those created using traditional compiled languages.

While visual programming environments eliminate coding altogether, other programming tools require programmers to write their applications using a procedural language or a scripting language, but enable them to create the GUIs for their applications visually. Code for the interfaces is generated automatically, behind the scenes, as the programmers paint their screens.

Products in this category include Microsoft Corp.'s Visual Basic, a programming environment for developing Windows applications. Although it can be used to build Windows-based interfaces to drive databases and spreadsheets, for example, Visual Basic is primarily a tool for developing stand-alone applications.

A programmer using Visual Basic starts by using a palette of design tools to develop the new application's GUI. He or she then uses a language called QuickBASIC to write the program. Derived from Basic, and therefore fairly easy to learn, QuickBASIC is nevertheless a conventional programming language, and few end users will have the patience to master it. While many users could easily learn to create a user interface, most would find it much more difficult to write a Visual Basic program.

Some application-development tools on the market feature scripting, or the ability to automate applications that are normally interactive. Word-processing packages and spreadsheets sometimes have their own scripting capabilities. For example, Informix's

"THE TASK IS TO INTEGRATE THE OLD AND THE NEW."

Hellmuth, Obata & Kassabaum Architects

To a great extent, the day of the bulldozer is over.

Buildings, like the historic St. Louis Union Station, are saved. And made even more valuable by putting them to new uses. Architects call it "adaptive re-use."

There are parallels in computing. Mainframes are saved. And made even more valuable by becoming part of the on-line enterprise. Software architects call it "mainframe integration."

There is one software architecture that is designed to integrate the old and the new: Sybase.

Sybase integrates any CICS application and data source—IMS, VSAM, DB2 and more—into an advanced client/server computing environment. The mainframe becomes a high performance server in a network of PCs, workstations and minicomputers.

Sybase. Client/server architecture for the on-line enterprise.

To find out more about our database, application development and connectivity products, and multi-vendor consulting services, call 1-800-8-SYBASE.

©1991 Sybase, Inc.

Once among the world's busiest train stations, the old St. Louis Union Station has been redesigned by Hellmuth, Obata & Kassabaum into an award-winning urban complex that includes a hotel, restaurants and shopping center.

 **SYBASE**

CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Wingz graphical spreadsheet includes the Hyperscript language. Using an application's scripting language, users can automate routine tasks that they would otherwise have to perform interactively.

UserLand Software Inc.'s Frontier, a Mac product, consists of a scripting language and an object database. In addition to writing scripts to control the Mac's file system and operating system, a Frontier user can potentially create scripts that incorporate multiple applications, controlling word processors, spreadsheets or database programs. However, Frontier's scripts can only work with applications that implement an inter-application communication protocol. UserLand is encouraging the development of such applications by distributing a software development kit that will help developers incorporate interapplication communication technology in their applications.

Like traditional programming languages, scripting languages are procedural and aren't particularly easy for end users to learn. Frontier's language, for example, uses a C-like syntax. However, the product employs an outlining metaphor to help users structure their programs, and UserLand claims that power users should have little trouble mastering the tool.

Letting Users Wing It

It's a truism that users don't always know what they want from applications. Fortunately, many of the newest programming tools feature an incremental, interactive design methodology that accommodates the user tendency to "wing it." Programmers can figure out what they're doing as they go along, building part of the program, running it to check the results, and then building some more.

Many programming tools on the market today include sample programs, explicit guidelines and tutorials. But the fact remains that although programming tools are becoming easier to use and promise to make programmers much more productive, relatively few end users will have the patience to master them.

Most users are more likely to end up using applications that professional programmers have created with these new tools.

When end users can learn to program in the same amount of time it takes them to learn to use a typical application, end-user programming will be a feasible idea, according to analysts at the Gartner Group in Stamford, Conn. Because end-user programming tools still aren't that easy to use, investing in them for wide-scale use at this time may be a waste of corporate resources, they say.

When end users can learn to program in the same amount of time it takes them to learn to use a typical application, end-user programming will be a feasible idea.

Although the programming tools themselves are affordable, averaging about \$200 apiece, the time that users spend learning to use them may turn out to be much more costly. Managers need to weigh these costs against the potential savings in IS staff resources.

Application Libraries

While most users may never become programmers in the traditional sense, the movement to give end users more control over their computing resources will continue to grow. According to the Gartner Group, one way for corporate IS departments to meet individual end users' needs, short of assigning a programmer to every user, might be to create libraries of applications—or bits and pieces of applications—that users could modify or combine to suit them-

selves. An IS group might create 50 to 100 different macros for a basic spreadsheet package, for example, which users could then edit for their own use.

Thanks in large part to the proliferation of PCs, a large pool of the workforce has now warmed to the use of computers, and some users are ready to venture beyond the word-processing and spreadsheet packages they cut their teeth on. These power users are eager to create their own applications if they can find a relatively painless way to do it.

By and large, programming tools continue to fall short of users' imaginations and to exceed their capabilities. The development of a standard for end-user programming tools could help considerably. But in the meantime, investing in relatively easy-to-use programming tools can be a wise move if IS managers offer these tools only to users who are ready for them.

Support from the IS staff will help ensure that these power users transcend the frustrations they'll encounter during the learning curve. Some organizations may want to form IS teams to help users debug or optimize their programs, or provide help lines for their fledgling programmers. But managers that have had positive experiences with end-user programming report that formal mechanisms for providing support aren't as essential as a helpful, cooperative IS staff. Motivated users will virtually train themselves, they say. And as they do, other users may jump on the bandwagon.

One thing's for sure: IS managers need to keep their customers satisfied, and that means expediting user requests and getting applications and computer resources into the hands of those who need them. Users who assume responsibility for creating their own applications will likely end up with applications they can use. And eventually, their self-reliance may result in a reduction of the IS backlog. ☐

Lucie Juneau is a freelance writer based in Salem, Mass.



No Fences. No Boundaries. No Limits. That's The Freedom Of CA90s.

The freedom to choose the best applications without worrying about hardware constraints.

The freedom to right-size your entire computing environment with the best mix of hardware platforms.



And the freedom to integrate and automate all your applications across the many proprietary, closed environments you face today. It's all there inside the most comprehensive architecture ever developed: CA90s.

The only architecture that supports every major hardware platform including IBM, Digital, Hewlett-Packard,

Apple, Fujitsu, Bull, Data General, Tandem and Hitachi. All the major operating systems: MVS, VSE, VM, VMS, UNIX, APPLE, WINDOWS, DOS and OS/2.

And the world's broadest range of integrated software solutions, covering systems management, information management and business applications.

If you're tired of being fenced in, call 1-800-645-3003 for complete information on CA90s.

The architecture that can set you free.

**COMPUTER
ASSOCIATES**
Software superior by design.

EVENTS

1992 International Help Desk Conference

New Orleans Marriott, New Orleans
February 23-27
Help Desk Institute
719 531-5138 or 800-248-5667

Emerging trends, state-of-the-art solutions and the latest products in help-desk technology highlight this conference. Included are keynote and general-session speakers, breakout sessions and over 100 products and services exhibitor booths. Registration fees: \$795 for members; \$895 for nonmembers.

The Business of IT: Finding the Payoff

Loews Coronado Bay, San Diego
March 8-11
CIO Publishing Inc.
800 366-0246 or 508 872-8200

Peter Drucker is the keynote speaker at this conference. Sessions focus on aspects of IT management, technology investments, competitive strategies and corporate business development. In addition, there are organized networking and discussion groups. Registration fees: \$850-\$1,295.

Fifth International Computer Virus & Security Conference

New York Marriott and Loews New York Summit, New York
March 12-13
DPMA Fin. Industries Chapter
212 663-2315 or 800 835-2246

This conference consists of five tracks: recovery, product demonstrations/evaluations, management, technical/research and CDP exam prep course. Recent outbreaks, intruder prevention and detection, E-mail and justice issues are some topics of exploration. Registration fees: \$275-\$395.

SIM 1992 Institutional Member Conference

PGA National Resort, West Palm Beach, Fla.
April 1-3
SIM
312 644-6610

This conference is designed to help IS executives meet the challenges of rapidly changing computing and telecommunications. The impact of IT on the consumer sector, manufacturing floor, family structure and other key areas is discussed. Registration fees: \$950-\$2950.

CIO Sales Offices

President and Publisher
JOSEPH L. LEVY
508 935-4601

Director of Marketing
CATHY O'LEARY HAYES
508 935-4521

Inside Sales Rep., List Services
STEPHANIE LEGELIS
508 935-4433

Sales & Marketing Specialist
BRIDGET CAMMARATA
508 935-4035

CIO Publishing Inc.
492 Old Connecticut Path
PO Box 9208
Framingham, MA 01701-9208
508 872-8200, FAX 508 872-0618

NEW ENGLAND

Regional Director/Advertising Sales
LINDA L. BURTON
508 935-4039

CIO Publishing Inc.
492 Old Connecticut Path
PO Box 9208
Framingham, MA 01701-9208
508 872-8200, FAX 508 872-0618

EAST COAST

Regional Director/Advertising Sales
MICHAEL J. MASTERS

Advertising Sales Assistant
PATRICIA GABELMANN

CIO Publishing Inc.
30 Two Bridges Road, Suite 340
Fairfield, NJ 07004
201 227-1140, FAX 201 227-1565

MIDWEST/SOUTH

Regional Director/Advertising Sales
BILL McDONOUGH

Advertising Sales Assistant
CAROL LEE GOCKENBACH

CIO Publishing Inc.
10400 West Higgins Road, Suite 300
Rosemont, IL 60018
708 827-4515, FAX 708 827-9159

WEST COAST

Regional Director/Advertising Sales
GERALD E. PARSONS

Regional Manager/Advertising Sales
RICHARD BASTAS

Advertising Sales Assistant
KIM N. VITO

CIO Publishing Inc.
220 Montgomery Street, Suite 1120
San Francisco, CA 94104



I N D E X

Page numbers refer to the first page of the article(s) in which the company is mentioned. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

Company Index

AT&T.....	28, 66, 74
American College Testing	36
American Custom Software	56
Apple Computer Inc.	66, 74
Apris Corp.	36
Arrow Products Inc.	56
Bankers Trust Co.	28
Baseline Software	74
Baxter Healthcare.....	56
Bear Stearns Companies Inc.	28
Borland International Inc.....	80
Bull.....	88
CIGNA Corp.....	36
Canover Industries Inc.	56
Channel Computing	36
Clarix Corp.....	80
Comsec Data Security Inc.	66
Corning Inc.....	74
Corporation for Open Systems	14
Daddy's Junky Music Stores	36
Digital Equipment Corp.	74, 78
Dillard's Department Stores	56
Ferodo America Inc.....	56
Films Inc.	14
Florida Power and Light	14
General Motors.....	66
Harbinger EDI Services.....	56
Harley-Davidson	14
Hartford Insurance Co.....	28
Health Risk Management Inc.....	36
Huffy Sports	56
IBM Corp.	28, 74, 78, 88
Informix.....	80
Integral.....	56
International Data Group	66
K mart Corp.....	56
Ledgeway/Dataquest	18
Lotus Development Corp.	66
MCI	28
McKinsey & Co.....	14

Metropolitan Life Insurance Co.	88
Microsoft Corp.....	80
National Westminster Bank	28
Novell.....	74
ON Technology Inc.....	66
Odesta Corp.....	80
Oracle Corp.	80
Paperfree Systems Inc.	56
Pilot Executive Software	74
Polaroid Corp.....	74
Procter & Gamble	14
Prudential Services Co. of America.	28
Putnam Co., The	36
ROLM	14
Sanyo	88
Sears Roebuck & Co.....	56
Serius Corp.	80
SkyTel Corp.....	74
Springs Industries Inc.....	56
Steve Jackson Games Inc.....	66
TRW.....	66
Target Marketing	36
UserLand Software Inc.....	80
Zenith.....	88

Advertiser Index

AT&T	13
AT&T Technologies.....	34
Andersen Consulting	71
Apple Computer Inc.....	4
BMC Software	59
Bell Atlantic (regional).....	79
Boston University Corporate Education Center	31
Computer Associates	2, 85
Computer Bowl.....	30
Cylix.....	11
Data General Corp.....	87
Digital Equipment Corp.....	C2, 19
Fujitsu Ltd.	75
GE Capital Computer Leasing	6
GE Information Services	39
Ingres Corp.....	8
Int. Communications Association ..	C3
International Data Group	64
Lucas Management Systems.....	27
Motorola Semiconductor.....	73
N.E. Telephone (regional).....	58A
Novadyne Computer Systems Inc. .	77
Oracle Corp.	69
Software AG.....	C4
Sybase	83
Technology Investment Strategies .	54
Texas Instruments Inc.	16
US Sprint.....	61
Xerox Corp.....	81

Editorial, Advertising and Business Offices: 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208—(508) 872-8200. **Postal Information:** CIO (ISSN 0894-9301) is published monthly; and semimonthly in April, May, June, September, October and November by CIO Publishing Inc., 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. Second-class postage paid at Framingham, MA, and at additional mailing offices. **Reprints:** Copyright 1991 by CIO Publishing Inc. All rights reserved. Reproduction of material appearing in CIO is forbidden without written permission. Send all reprint requests to Permissions Editor, CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. **Photocopy Rights:** Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CIO for users through the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Massachusetts 01970. Please specify: ISSN 0894-9301. Permission to photocopy does not extend to contributed articles followed by this symbol: Φ . **Microfilm:** CIO issues and articles can be purchased on 16mm and 35mm microfilm and on 105mm microfiche through University Microfilms International, Serials Acquisitions Department, 300 N. Zeeb Road, Ann Arbor, Michigan 48106. **Subscriptions:** Address subscription inquiries to CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208 or call (800) 788-4605. CIO is distributed free of charge to qualified top information executives. To all others, the one-year basic rate for the U.S. and Canada is \$94. For rates to other countries, please write the publisher. The single copy price is \$7. All subscriptions payable in U.S. funds only. Please allow four to six weeks for new subscriptions to begin. **Change of Address:** Please allow four to six weeks for change of address to take effect. **Postmaster:** Send change of address to CIO, P.O. Box 489, Northbrook, Illinois 60065-9816.

Satisfy your hunger for more productivity...for less!

PCs. Workstations. Even mainframes. You've spent millions to give everyone in your company some kind of computer. And productivity still keeps going down! Now what? Do you scrap everything and start over? Or do you call Data General to finally profit from your expensive computers?

Our AViiON System—mainframe power that fits in a pizza box—can quickly and affordably increase productivity for much lower costs. With an AViiON server and software, your PCs, Macs, terminals, workstations and networks—whether you have 10, 100, 1,000 or more—can work together as a team. And with a starting price of under \$100,000 you'll save \$4 million or more compared to a huge mainframe's price. Finally, you can enjoy all the productivity you were promised from computers. And it's as easy as ordering pizza.

Call **1-800-DATA GEN**

Data General

The AViiON System.
Mainframe power that
fits in a pizza box.



Data General
Life just got
a whole lot easier!

AViiON is a trademark of Data General.
Mac is a registered trademark of Apple Computer
© 1991 Data General

SuperSONIC

Several years ago, MetLife set out to bolster sales-force productivity with a distributed network called SONIC. The network is so ingrained in sales operations that the staff rarely makes a move without it. Now underwriters are logging on too.

When the Metropolitan Life Insurance Co. first automated its sales function, customer records were centralized on computers at home offices. Inadvertently, copies of the records were simultaneously removed from branch offices. "We were looking for an opportunity to increase customer service and help our own internal people in terms of sales," said Senior Vice President Dan Cavanagh. When records were centralized, "the issue became, 'How do we get information to those sales offices?'"

In a collaborative effort between IS and the business side, SONIC—the Sales Office Network of Intelligent Computers—was born. The initial system consisted of distributed Honeywell minicomputers, dumb terminals and printers networked to mainframes. "The vision of the IS people and the potential of linking far-flung offices led to what we called hybrid processing," said Cavanagh. "At the time, we were too dumb to call it cooperative processing."

Now at least 10 years old, SONIC continues to evolve along with MetLife's needs. The original mini architecture is being replaced

on a gradual basis with IBM-compatible PCs supplied by Bull (which is also serving as the integrator), over 10,000 Zenith laptops, and Sanyo laser printers.

"We need more capacity," Cavanagh explained, "and replacing the minis with PCs is the most cost-effective way [to get it]."

Local area networks are being installed to link all the new equipment and support a seamless cooperative computing environment at both the office and the point of sale.

By 1985, SONIC was fully installed in branch offices nationwide. Today, 15,000 salespeople in 1,000 offices use SONIC to support every aspect of sales, from generating form letters and mailing lists to creating complex proposals. According to the company, overall business has more than doubled over the past four years, and the system has made it possible for salespeople to increase the volume of their commissions by 45 percent.

One example of SONIC's impact is in the area of creating sales proposals. "In the past, . . . it might take from five to 10 days [for a salesperson to make] a proposal, depending on the mail," said Cavanagh. With intelligent networking, salespeople now have immediate access from any workstation to information residing on mainframes in home offices. A variety of projections based on different policy criteria and customer needs can be made quickly,

resulting in improved customer service and efficiency.

Perhaps the most valuable aspect of SONIC is its flexibility. As MetLife has grown and changed, so has the system. According to Cavanagh, the original SONIC encompassed only about 30 functions—even E-mail wasn't among them. Today it performs well over a hundred functions, and the number will continue to grow.

Cavanagh believes that SONIC has improved the new-applications learning curve among employees. In addition, SONIC has facilitated a 59 percent increase in the sales staff with only a minor increase in support personnel.

Now that the technology has become ingrained within sales, it is beginning to penetrate other departments as well. Underwriters use SONIC in conjunction with another system to improve their productivity and communication with the sales offices. And Cavanagh and systems group Vice President Len Miller believe that SONIC will provide the backbone to redesign business processes throughout the entire company.

Even with all the added benefits, the *raison d'être* of the system has not changed. "The principal goal of SONIC is still to help improve sales productivity and support the sales force," Miller said. "Anything else is a by-product."

—Megan Santosus

VITAL STATISTICS

Organization: Metropolitan Life Insurance Co., New York

Application: Sales-support system

Scope: 15,000 salespeople located in 1,000 offices nationwide

Sponsors: Corporate management staff

Technologies: A network of desktop PCs, laptops and LANs connected to 11 central IBM mainframes via multidrop leased lines

Objective: To improve sales productivity and support the sales staff

Payoff: Reduced cycle times needed to prepare sales proposals, improved customer service, lowered technology learning curve for all salespeople, and facilitated business-process re-engineering

FIND OUT HOW YOU CAN STAY IN THE BLACK

CALL 1-800-ICA INFO, OR COMPLETE THE ATTACHED REPLY CARD

LOCATION

Hyatt Regency Hotel, Atlanta, Georgia

ITINERARY

Monday, May 18, 1992 — Registration, Reception, Dinner

Tuesday, May 19, 1992 — Program

Wednesday, May 20, 1992 — Tour of ICA Expo exhibits

PRICING

Free to ICA member company executives

\$250 for non-ICA member company executives



“BOTTOM LINE STRATEGIES FOR THE ‘90S”

1992 ICA EXECUTIVE PROGRAM, MAY 18-20, 1992
SPONSORED BY *CIO MAGAZINE*

It may be the difference between staying in the
dark and staying in the black.

☐ *Yes!* I want to know more about this
information-filled, executive level program. Please send
a brochure with registration information to:

Name _____

Title _____

Company _____

Type of Industry _____

Mailing Address _____

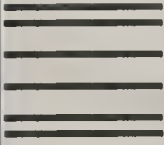
City / State / Zip _____

Country _____

Day Telephone / Fax _____

Member of ICA ☐ Yes ☐ No _____

Held in conjunction with the 1992 ICA Expo and Conference.



BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 4443 DALLAS, TEXAS

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN: AL WELLS

INTERNATIONAL COMMUNICATIONS ASSOCIATION

12750 MERIT DR STE 710 LB-89

DALLAS TX 75251-9961

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES





BOTTOM LINE STRATEGIES FOR THE '90s

1992 ICA
EXECUTIVE
PROGRAM

IT MAY BE THE DIFFERENCE BETWEEN STAYING IN THE DARK AND STAYING IN THE BLACK.

"Bottom Line Strategies for the '90s," the ICA 1992 Executive Program, will shed light on technologies that make a difference where it counts.

BUSINESS UNIT SUCCESS
THROUGH TELECOMMUNICATIONS
STRATEGIES

Cosponsored by *CIO* magazine and designed for VP- and CIO-level information technology officers, this

executive development program will help you manage strategic business units with greater efficiency by introducing you to advanced communications products and services. Informative case studies, presented by senior information officers, will assist you in identifying success strategies. You'll hear how your peers have implemented effective telecommunications programs which

resulted in a positive impact on the bottom line of business units.

INTERACTIVE FORUM FOR SOLVING
CRITICAL BUSINESS PROBLEMS

"Bottom Line Strategies for the '90s" is a highly interactive forum. Questions will be encouraged and you will find ample opportunity for in-depth discussions during the formal program, at the breaks, and social functions. The insights you gain will prove invaluable—both personally and professionally.

PLATFORM FOR PROFESSIONAL
AND PERSONAL SUCCESS

The ICA Executive Program, held in conjunction with the 45th ICA Conference and Expo, is open to all information technology executives. As a part of the Executive Program, participants will tour the Expo and view the products and solutions discussed during the seminar.

Plan now to attend "Bottom Line Strategies for the '90s." For more information, call toll free: 1-800-422-4636.

Because with so much potential for profit, why stay in the dark?

1992 ICA
EXECUTIVE
PROGRAM

DATES: May 18 – Registration/Reception/Dinner; May 19 – Program; May 20 – Tour of ICA Expo. PLACE: Hyatt Regency, Atlanta, Georgia. COST: Free to ICA member company executives; \$250 for nonmember company executives.

With a global economy, rising competition and pressures to cut costs while improving service, most CEOs are asking tough questions: "How can we compete? What strategic direction is best? And am I getting my money's worth for all my IS expenditures?"

You have the right to demand proven results and ROI for your information dollars. But without the right tools, doing more with less may be impossible.

SOFTWARE AG has an offer for you:

Does your IS organization have what it needs to cut applications development time in half?

SOFTWARE AG guarantees to save you time and money.

Using our software development environment and advanced techniques, we'll work with your staff to cut the time it takes to develop your application in half, or it costs you nothing!

Most important, there's no risk. If we can't deliver a working system in half the time, simply return the tools at no cost. Your alternative is to risk a great deal by doing nothing. Have your IS managers call today!

Don't believe us? Call 1-800-843-9534, ext. 700 and see for yourself!



 **SOFTWARE AG**
SOLUTIONS WORLDWIDE